

1972

The Bryophytes of Shelby County

Linda L. Spessard

Eastern Illinois University

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THE BRYOPHYTES OF SHELBY COUNTY

(TITLE)

BY

Linda L. Spessard

THESIS

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF

Masters of Science

IN THE GRADUATE SCHOOL, EASTERN ILLINOIS UNIVERSITY
CHARLESTON, ILLINOIS

1972

YEAR

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PHYLOGENETIC LIST OF BRYOPHYTES

Tetraphidaceae

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INTRODUCTION AND HISTORY

There have been only ten county bryological studies and two state-wide bryological studies made in the state of Illinois. None of the studies made mention of the mosses and liverworts of Shelby County. The purpose of this paper is to describe and to illustrate with line drawings, the 80 Musci and 16 Hepaticae found in Shelby County.

Shelby County is located in the southeast-central part of Illinois, occupying a total area of approximately 767 square miles. It is bordered on the south by Effingham and Fayette Counties, on the west by Christian and Montgomery Counties, on the north by Macon and Moultrie Counties, and on the east by Coles and Cumberland Counties. Shelby County has an average elevation of 650 feet and the average rainfall is 41.3 inches. The prevailing topography of the southern and western parts of Shelby County is essentially that of a flat plain which has been partially dissected by the headwater erosion of a few small streams. Differences in topography are generally very marked, the nearly level remnants of the table land falling off abruptly into deep-sided valleys, whose bottoms are usually 50 to 60 feet below the level of the uplands. The drainage of the uplands is poor, for the topography is such that the surface waters run off slowly. A series of morainal hills extends southward through the county. In contrast to the southern and western portions of Shelby County, the topography of the central, northern and northeastern parts of the county is primarily undulating to rolling, with good drainage.

Two glaciers have had a great influence on the present soils of Shelby County. Illinoian, the earlier of the two ice sheets, covered the entire county, and on melting back left a broad and gently undulating plain, large portions of which still persist in the southern and western parts of the county. The Wisconsin, the last glacier to enter this region, advanced from the northeast to cover approximately two-fifths of what is now Shelby County. The general level of the Wisconsin till plain varies from 25 to 75 feet above that of the Illinoian and its terminal point is marked by a broad ridge of rolling topography.

Shelby County is made up mainly of types of silt loam soils with some sandstone rock outcrops. There is some clay loam and gravelly loam interspersed. Within Shelby County is an artificial lake covering 173 square miles, which extends northward into neighboring Moultrie County.

The vegetation making up the forested areas is mainly oak-hickory (Quercus spp., Carya spp.) with sugar maple (Acer saccharum Marsh.) and some white ash (Fraxinus americana L.) found less frequently.

REVIEW OF LITERATURE

A review of the literature reveals that no studies have been made of the vegetation of Shelby County, Illinois. However, some research has been done on Illinois bryophytes, although the volume is not great. Wolf and Hall (1878) were the first to attempt any county bryological studies. Their work was concentrated in Menard and Fulton Counties, and also included the southern counties of Union, Johnson, and Jackson. They listed 153 mosses and 45 liverworts. The paper also included several species of lichens found growing in the counties under consideration.

Nine years later, Brendel (1887) did a study of the vegetation of Peoria County. In this paper, he included a checklist of 87 mosses and 24 liverworts. Following Brendel's work in 1887, there was very little interest shown in Illinois bryology. After a lapse of 43 years, Hague (1930) produced a very comprehensive state-wide study of Illinois mosses in which she listed 265 species. Her research included Peoria, Fulton, Kane, Cook, McHenry, Lake, Carroll, Menard, LaSalle, Will, Kankakee, Marion, DuPage, Sangamon, Champaign, Wabash, Stark, Henderson, Union, Johnson, Ogle, Randolph, Rock Island, Hancock, Schuyler, and Winnebago Counties. Her records did not include Shelby County. Hague (1934) again reported 71 Musci from several southern counties: Saline, Pope, Johnson, Union, Williamson, and Hardin Counties. The same year, Galligar (1934) lists 5 liverworts and 35 mosses she found in a bryological survey of Macon County.

In 1937, Hague published a state-wide study of Illinois Hepaticae. She listed 66 hepatics from Cook, Champaign, Fulton, Menard, Union, Kankakee, LaSalle, Peoria, St. Clair, Knox, Carroll, Ogle, Rock Island, Will, DuPage, Henderson, Jo Daviess, Macon, Wabash, Stark, Lake, Tazewell, Johnson, and DeKalb Counties, with no mention of the Hepaticae of Shelby County. Following Hague's studies, scattered county reports occurred in the following order: Richards (1940) reported 18 liverworts and 33 mosses he found in a survey of Starved Rock State Park, LaSalle, County; Vaughn (1941) lists 14 hepatics and 74 Musci he found in a study of Clark County, Illinois; Arzeni (1947) reported 42 liverworts and 130 mosses collected in a study of Coles and Clark Counties; Hatcher (1952) considered the bryophytes of Jackson, Union, and Pope Counties in Southern Illinois. His study included 30 liverworts and 63 mosses. Morrow (1952) reported 17 common Musci of McDonough County. Skorepa (1968) listed 58 liverworts in Jackson, Union, Johnson, Gallatin, Randolph, Pope, Saline, and Hardin Counties. No other work has been done to date related to specific county or state-wide studies in Illinois bryophytes.

MATERIALS AND METHODS

The Bryophyta studied were collected from Shelby County, Illinois. The material represents mosses and liverworts from a variety of habitats. Several hydrophytes collected along streams such as Richland Creek, Robinson Creek, Mitchell Creek, Lithia Springs Creek and the Kaskaskia River are included. Many were mesophytes from ravines, from tree trunks, from the base of trees, along paths, on rocks, sides of buildings, on rotten logs, and on sandstone rock outcrops. Others were found in open fields, yards, and shaded areas.

The author's determinations of all specimens have been corroborated by Dr. Charles B. Arzeni. The bryophytes collected were stored in standard bryological packets containing the following data: scientific name and authority for each species, whether fruiting or sterile, the county and state in which the specimen was collected, specific habitat information, the collector's name, the determiner's name (if different), the date collected, and the collection number. The specimens were deposited in the author's collection with duplicates placed in the Ernest L. Stover Herbarium, Eastern Illinois University. Taxonomic keys used in the determination of species were by Grout (1929-1940, 1903), Conard (1956), and Welch (1957).

Descriptions of the gross external morphology as well as microscopic morphology were made for each species. The descriptions included: the general habit of the plant under study, the leaf arrangement on the stem, the branching pattern, the overall size of the plant, the leaf

morphology, and the aerolation plus cell size. Sporophyte characteristics considered included the color, shape and size, plus the seta size and color, the peristome characteristics--their color and number of teeth, and the spore morphology. The habitat was given for every moss and liverwort, as well as the distribution data for each species reported for Illinois to date. Measurements were taken with a calibrated ocular micrometer. An average of six measurements were made for each structure and the maximum and minimum recorded for each plant. The illustrations were made using a camera lucida attached to a Carl Zeiss microscope. Permanent mounts were made of each species using Hoyer's mounting medium.

The descriptions and illustrations of the Musci are arranged phylogenetically as given by Grout (1940). The Hepaticae follow the arrangement by Evans (1940).

FAMILY: TETRAPHIDACEAE

Tetraphis pellucida Hedw.

Plants in dense to loose, wide tufts and sods, yellowish green; protonema of a green scale, not filamentous; stems erect, 1-3 cm. long, simple or branched, densely radiculose at base; barren shoots frequently with terminal gemmiferous cups, about 1 mm. in diameter, formed by 4-5 broadly cordate, obovate, or reniform leaves, truncate to apiculate, containing lenticular, many celled, stalked gemmae; upper leaves larger than the basal blades, close, ovate to ovate-lanceolate, from a narrow base, 1-1.3 mm. long, 0.5-0.75 mm. wide, ending below apex, apices mostly acute, margins plane, entire; median cells of leaves almost isodiametric, rounded hexagonal, 8-20 μ in diameter, incrassate; autoicous; inflorescence apical; calyptra whitish, conical, acute, solid and rough at apex, lacerate below, enclosing the entire capsule; seta yellowish to reddish or brown, erect, 1-1.5 cm. long; capsule reddish, erect to ascending; operculum lustrous, acutely conical, cleft on one side, beak straight or oblique; urn green when young, bright reddish brown when ripe, usually symmetrical, rarely subarcuate, narrowly cylindrical, 2-2.7 mm. long, persistent; annulus none; peristome reddish to brownish, single, teeth 4, linear-triangular, thick, up to 0.9 mm. long, approximately 1/5 length of capsule; spores 8-12 μ in diameter, slightly papillose, mature in spring to early fall.

Habitat: In deep shade or moist woods, on humus, peaty soil, wet rotten wood, or porous sandstone.

Illinois distribution: Clark, Coles, Cook, Jackson, Lake, LaSalle,
Menard, Ogle, and Shelby Counties.

Tetraphis pellucida Hedw.

Fig. A - Leaf - 40 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

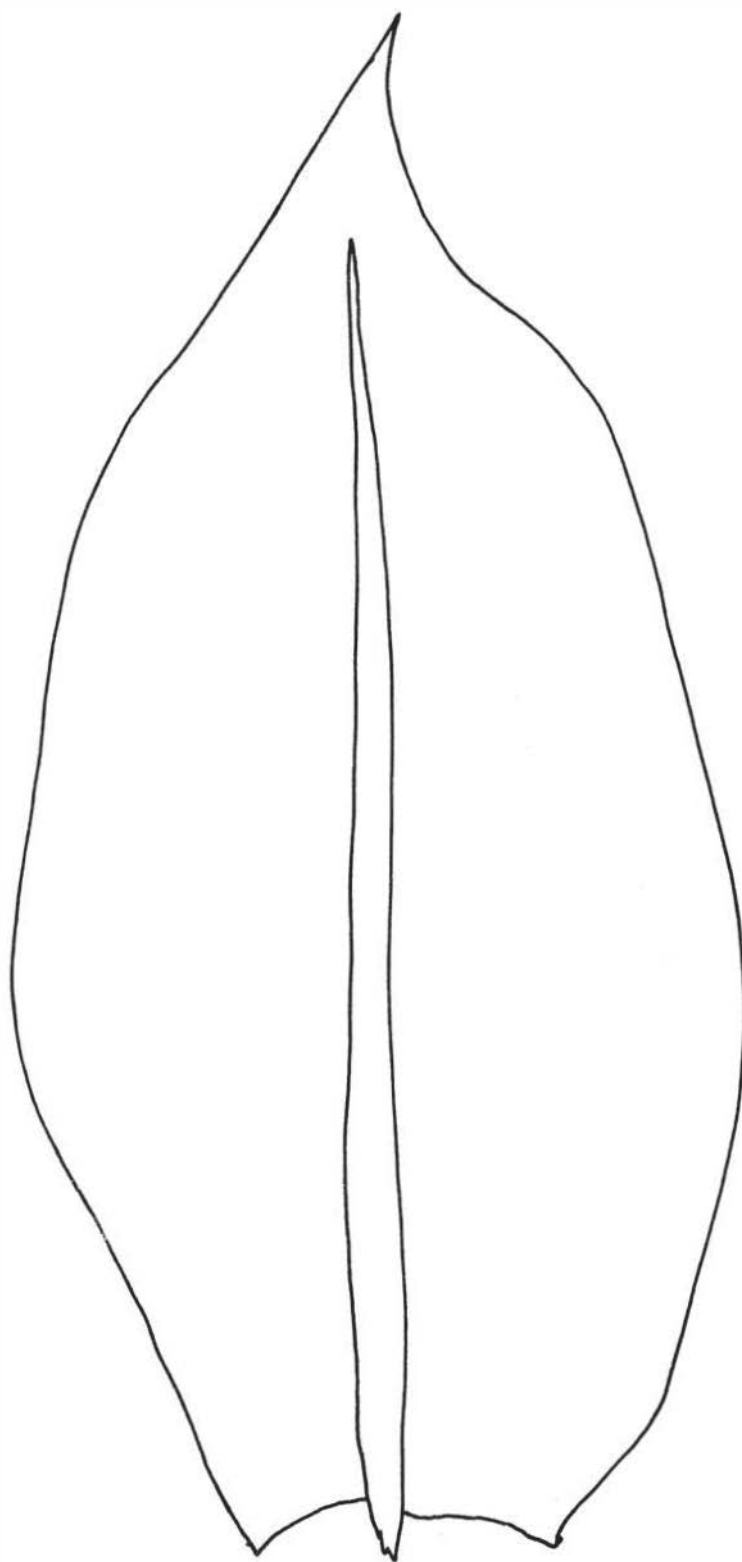


FIG. A

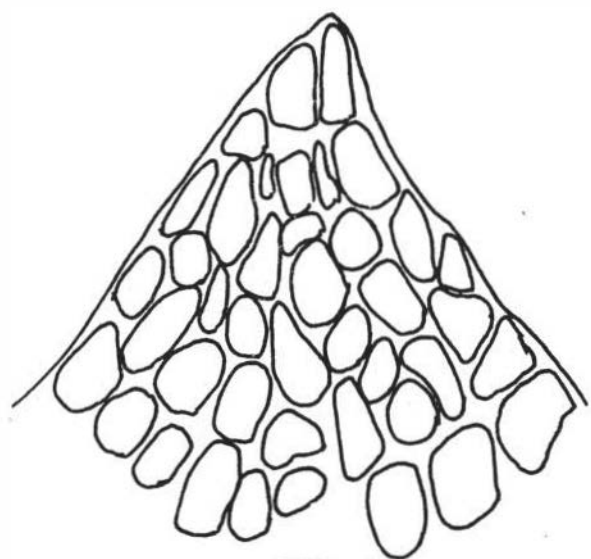


FIG. B

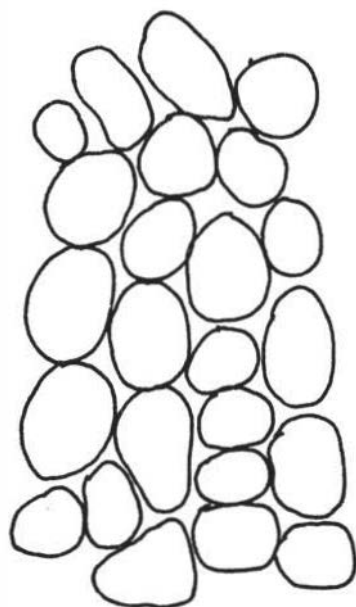


FIG. C

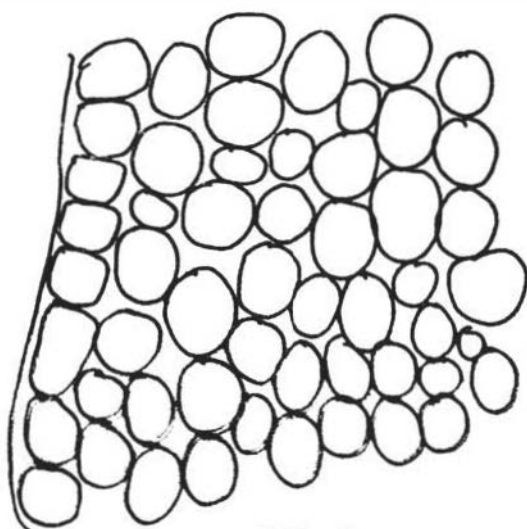


FIG. D

FAMILY: POLYTRICHACEAE

Atrichum angustatum (Brid.) B.S.G.

Plants medium in size to moderately robust, in clusters or tufts, dark olive green; reddish brown with age; stems erect from a branched rhizome, simple, 1-5 cm. high, usually up to 3 cm.; leaves of stems minute below, the size increasing above, the upper leaves lightly curled when dry, erect when moist, linear-lanceolate, 3-4.5 mm. long, 0.6-0.75 mm. wide, blade with few to many teeth on the lower surface of undulations, costa subprecurent, toothed near the apex on the lower surface, lamellae on upper surface 4-8, the costa and lamellae together composing $1/4 - 1/3$ of the median width of the blade, on upper $3/4$ of the blade 6-9 cells high, the marginal or top cells smooth, apices of leaves bluntish acute, ending in a tooth, blades bordered with 2 rows of elongate incrassate cells, almost entire length of the blade, margins serrate along upper $1/2 - 1/3$, teeth incrassate, often in pairs; upper cells of leaves rounded hexagonal, 7-15 μ in longest diameter, smooth, papillose; dioicous; calyptra cucullate, slenderly rostrate, 4-7 mm. long, split $1/3$ of its length; hispid at tip, chestnut brown, almost erect, operculum hemispheric, slenderly rostrate, 2-2.5 mm. long; annulus none; peristome single, teeth 32, linear-lanceolate, obtuse, 145-300 μ long, axis yellowish brown; spores spherical, pale green to reddish yellow, pellucid, smooth to slightly roughened, 10-18 μ in diameter, mature in late fall and winter.

Habitat: On sandy soil, clay or shale, particularly shaded, or in woods.

Illinois distribution: Champaign, Clark, Coles, Cook, Fulton,
Hancock, Jackson, Johnson, Kankakee, Lake, LaSalle, McDonough, Marion,
Menard, Peoria, Pope, Rock Island, Sangamon, and Shelby Counties.

Atrichum angustatum (Brid.) B.S.G.

Fig. A - Leaf - 34 X.

Fig. B - Apical cells - 104 X.

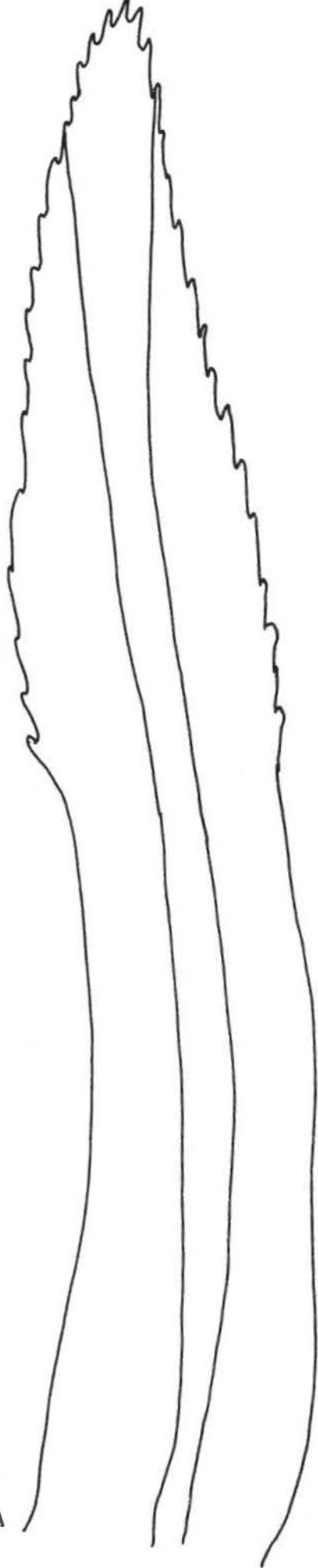
Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

Fig. E - Lamellae (x.s.) - 160 X.

Fig. F - Lamellae (l.s.) - 400 X.

FIG. A



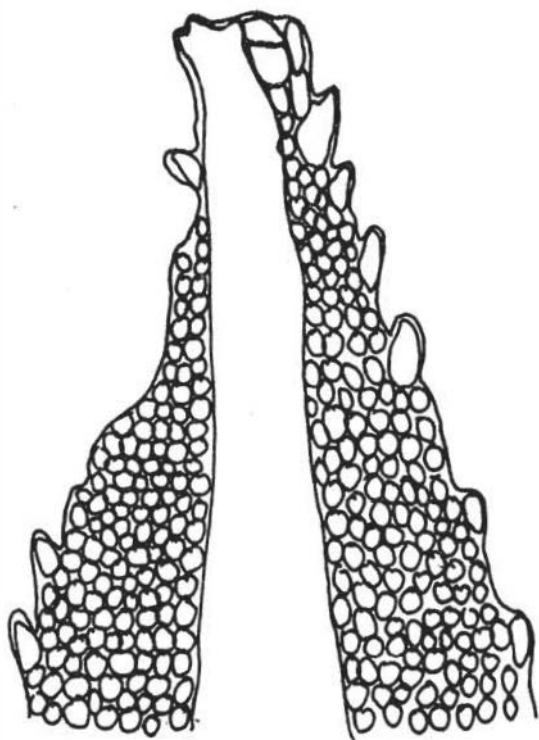


FIG. B

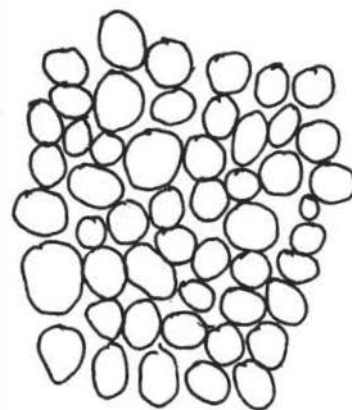


FIG. C

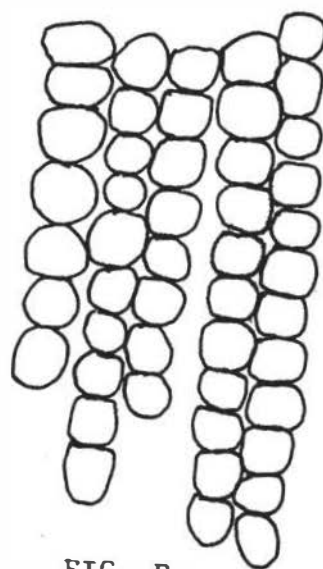


FIG. E

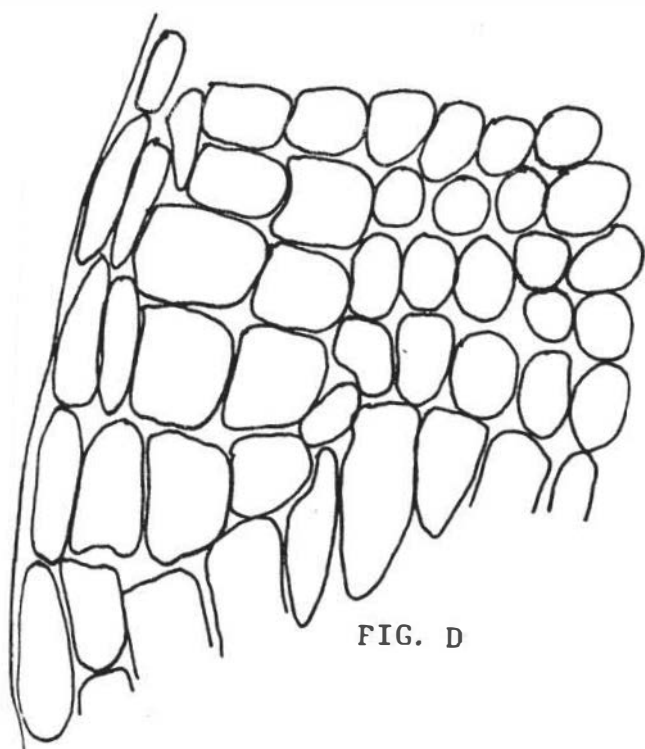


FIG. D

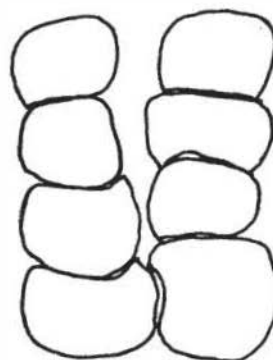


FIG. F

FAMILY: POLYTRICHACEAE

Atrichum undulatum Web. and Mohr.

Plants medium in size, in clusters, yellowish green to brown, stems erect, up to 8 cm. high, generally 3-4 cm.; leaves of stems minute below, size increasing above, upper leaves crispate when dry, widely spreading when moist, ligulate to lanceolate, 5-9 mm. wide, blade conspicuously transversely undulate, with teeth near apex on lower surface, lamellae along upper surface of costa, lamellae on upper $1/4 - 3/4$ of blade 2-6 cells high, the marginal cells smooth, apices of leaves sub-acute, ending in a tooth, margins bordered with 1 row of elongate incrassate cells, serrate along almost all of the leaf; teeth incrassate, in pairs, upper cells quadrate-hexagonal, 18-40 μ in diameter, smooth; polyoicous, calyptra pale, cucullate, slenderly rostrate covering $1/2$ of urn; seta reddish, erect, straight, 2-5 cm. long, capsule castaneous, inclined; urn slightly curved 4-5 mm. long, 0.7 - 1.3 mm. in diameter; annulus absent, peristome single, teeth 32, linear-lanceolate, pale; spores spherical, yellowish green to orange, 9-19 μ in diameter, almost smooth, mature in late fall.

Habitat: Moist, shaded soil, especially clay.

Illinois distribution: Champaign, Coles, Cook, Effingham, Fulton, Henderson, Johnson, Kankakee, Menard, Peoria, Pope, Shelby, and Union Counties.

Atrichum undulatum Web. & Mohr.

Fig. A - Leaf - 26.5 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

Fig. E - Lamellae - 400 X.

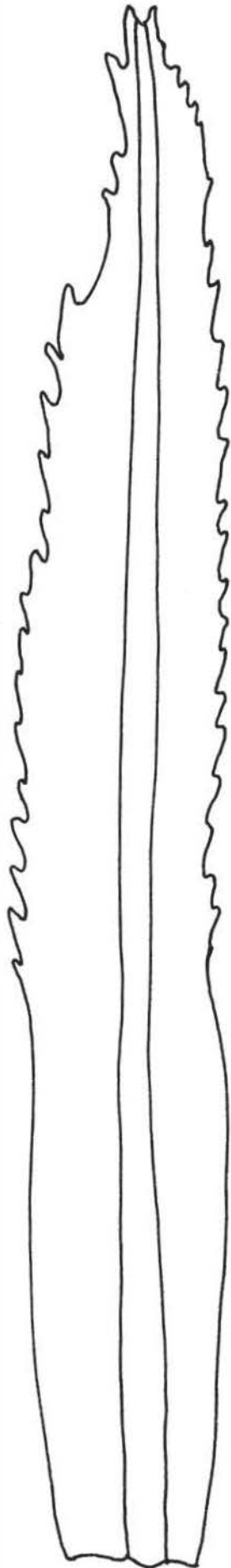


FIG. A

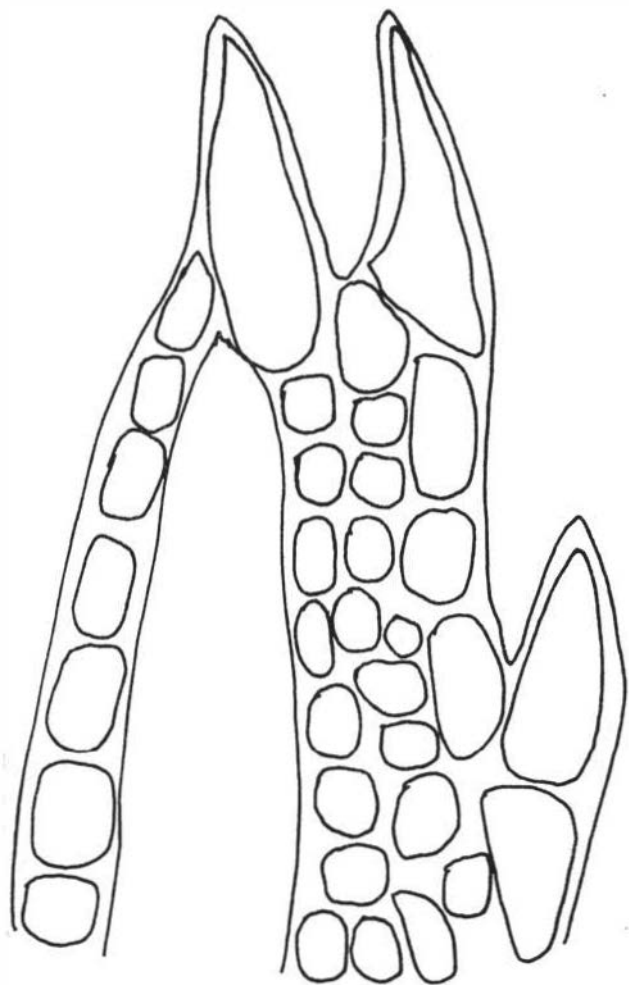


FIG. B

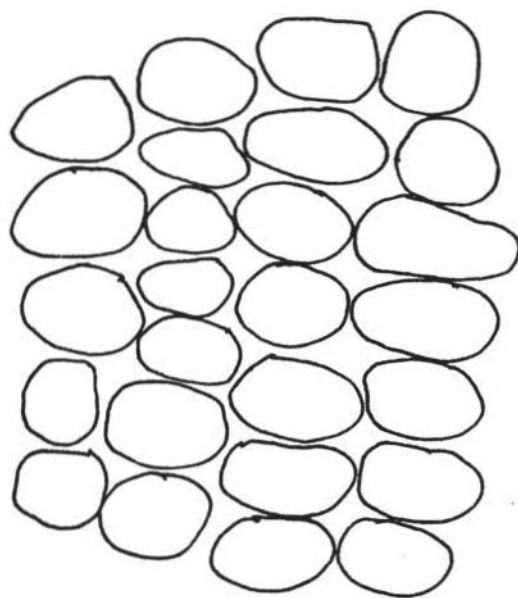


FIG. C

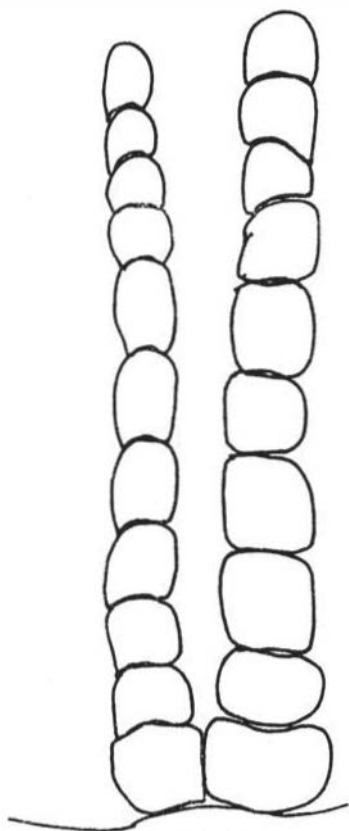


FIG. E

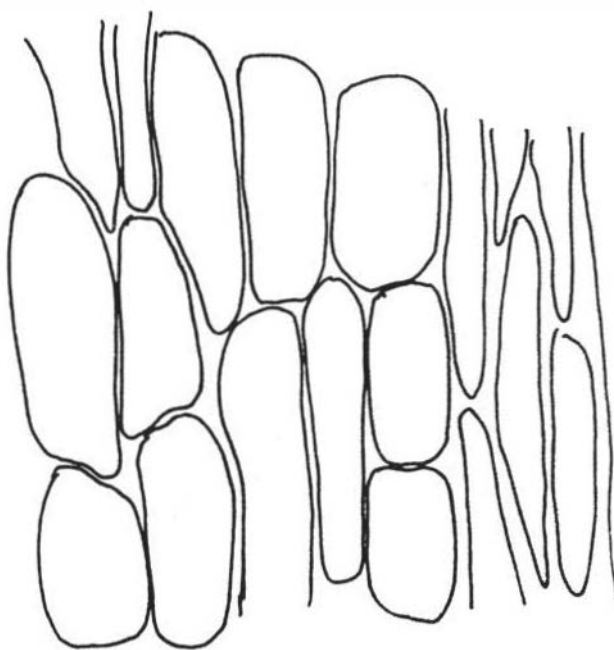


FIG. D

FAMILY: POLYTRICHACEAE

Pogonatum pensilvanicum (Hedw.) Paris

Plants scattered, sometimes clustered, forming thin sods, greenish to brown, on a green felt-like persistent protonema; stems erect, very short, 1-2 mm. high, sometimes up to 8 mm. long, simple, with rhizoids at base; lower leaves bract-like, upper few, erect when dry, ascending when moist; lanceolate-subulate from a sheath-like base, 3-4 mm. long, 0.28 mm. wide, sheath about 1/2 length of leaf, costa percurrent, smooth and slightly toothed on lower surface, with 10-15 lamellae along upper surface, 4-6 cells high, in cross section the marginal or apical cells of lamellae orbicular to oval, smooth to papillose, apices of leaves long acuminate, serrulate, margins of blades plane to entire, entire below, serrate in upper half; cells of blades at 3/4 up quadrate, rectangular, rounded, or oval, 10-20 μ in longest diameter, incrassate; dioicous; calyptra cucullate, extending well below capsule, light yellow or gray, densely hairy; seta yellowish to reddish, solitary, erect, yellowish to reddish; operculum briefly conic, 1/6 - 1/5 as long as urn, the beak about 0.4 mm. long, slightly curved; urn cylindric, unsymmetrical, about 4 mm. long and 0.8 mm. wide, minutely mammillose with bulging cells, without stomata, hypophysis separated by a slight constriction; annulus none; peristome single, teeth 32, about 200 μ long, 50-70 μ wide, basal membrane about 50 μ high; spores yellowish brown, 8-12 μ in diameter, smooth, maturing in late fall.

Habitat: On bare clay banks, especially if moist and shaded; frequently on clay roadside banks where soil is covered with dense felt of protonema.

Illinois distribution: Clark, Coles, and Shelby Counties.

Pogonatum pensilvanicum (Hedw.) Paris

Fig. A - Leaf - 26.5 X.

Fig. B - Apical cells - 160 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

Fig. E - Lamellae - 400 X.

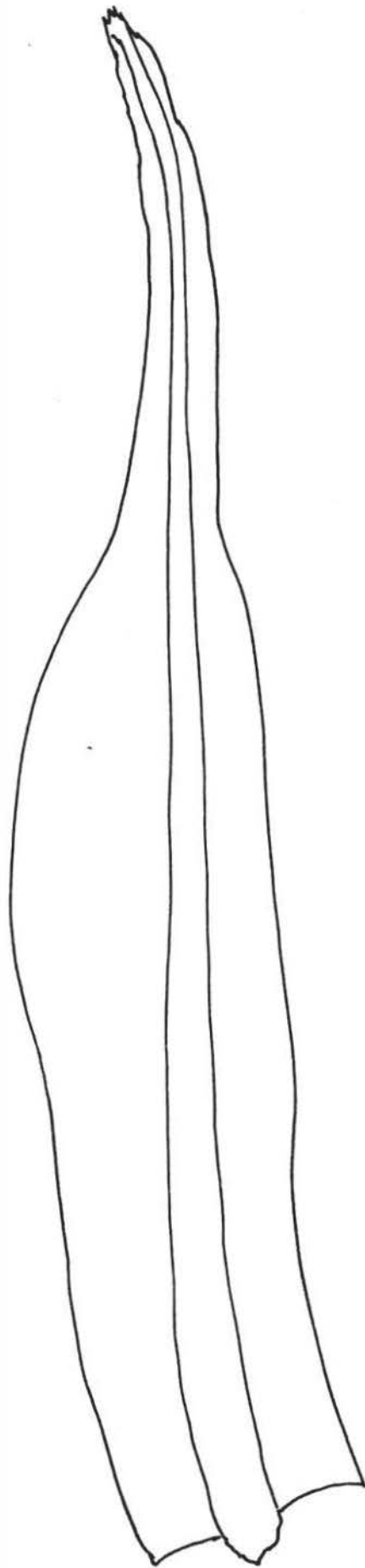


FIG. A



FIG. B

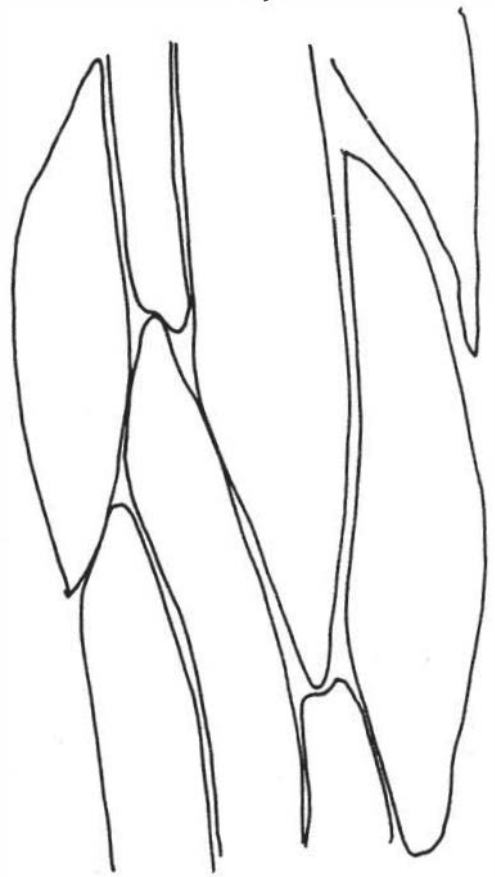


FIG. C

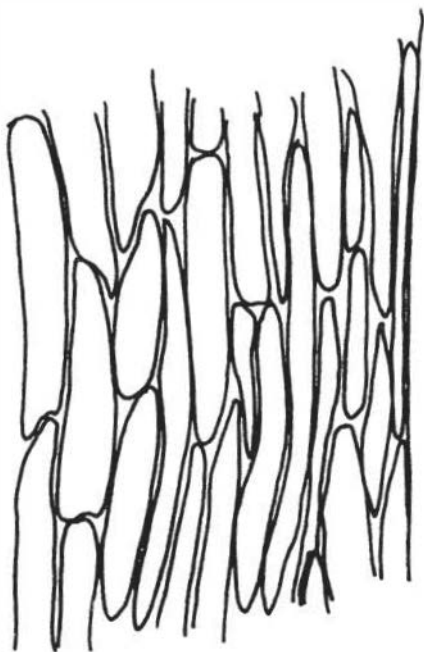


FIG. D

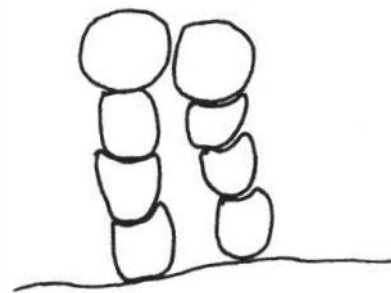


FIG. E

FAMILY: POLYTRICHACEAE

Polytrichum ohioense Ren. and Card.

Plants in loose tufts, bluish green; stems chestnut brown, erect, rigid, 2.5-5 cm. long, usually simple, 5-angled, from a 3-angled rhizoid, rhizoids at base of stems; leaves rather crowded, appressed to erect-spreading and somewhat contorted when dry, spreading to recurved when moist, linear-lanceolate from an oblong, sheathing base, blade 5-8 mm. long, costa excurrent, with a few teeth at the tip of the lower surface with 32-50 lamellae along the upper surface, 4-6 cells high, marginal or terminal cells, oval, smooth, apices acuminate, ending in a serrate arista, serrate nearly to the sheath, marginal cells, unistratose $\frac{3}{4}$ of the way to the tip, cuticle distinctly longitudinally striate, cells in middle of sheath longer than wide; dioicous; perichaetial leaves similar to upper leaves; calyptra light yellowish brown, densely hairy, shorter than capsule, not covering the base; seta dark brown below, yellowish brown above, 4-8 cm. long; capsule greenish yellow to yellowish brown, erect, operculum depressed, conic $\frac{1}{2}$ - $\frac{2}{3}$ as long as the urn, beak curved, approximately 1.5-3 mm. long; urn oblong, 3-6 mm. long, 1.5-3 mm. in diameter, narrowed toward base; annulus none; peristome single, teeth pale yellow with darker axis, 64; spores spherical, yellowish white, 8-17 μ in diameter, finely punctate, mature in midsummer.

Habitat: On soil, in moist, deep woods, in open woods, and in old fields.

Illinois distribution: Clark, Coles, Cook, Johnson, LaSalle, Sangamon, and Shelby Counties.

Polytrichum ohioense Ren. & Car.

Fig. A - Leaf - 26.5 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Lamellae - 400 X.

Fig. E - Alar cells - 400 X.

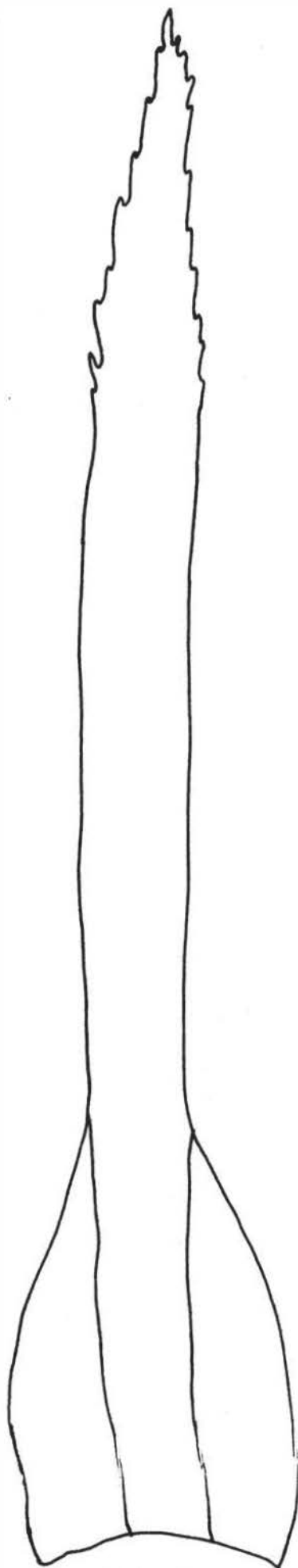


FIG. A

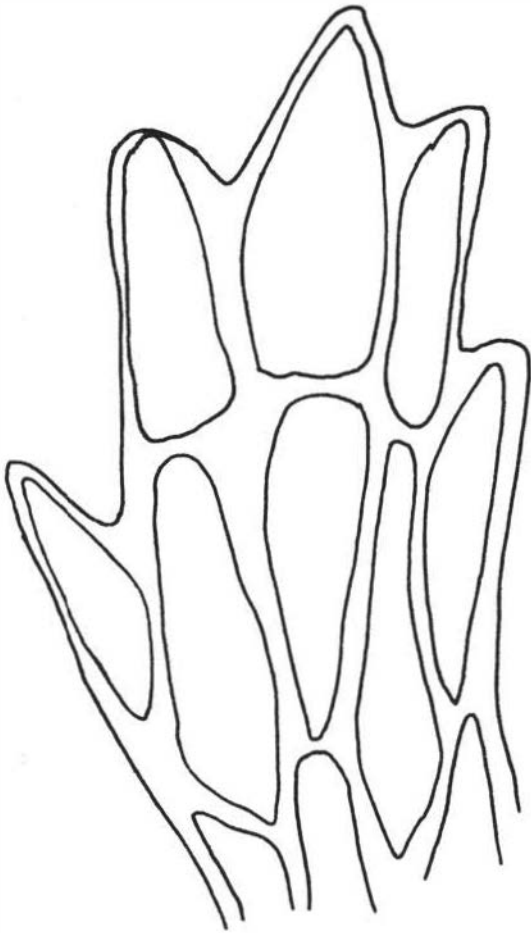


FIG. B

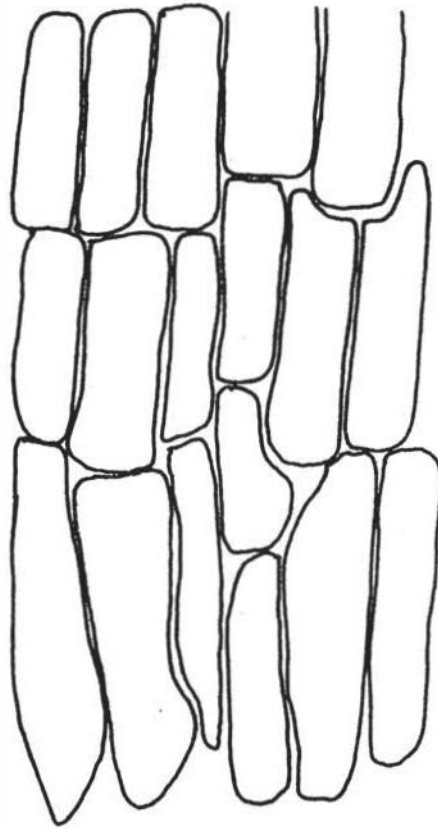


FIG. C

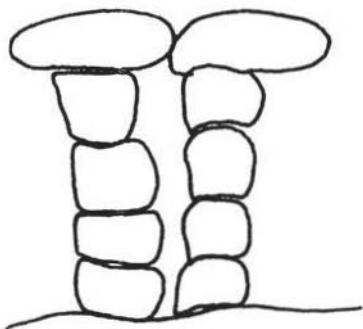


FIG. D

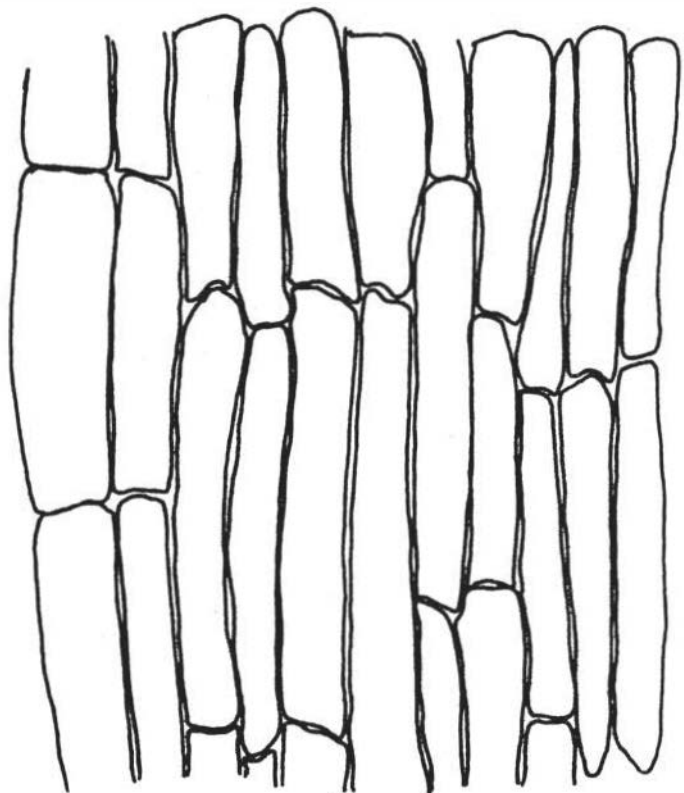


FIG. E

FAMILY: FISSIDENTACEAE

Fissidens bushii (Card. & Ther.) Card. & Ther.

Plants small, pale green or yellowish green; stems erect, 5-8 mm. long, simple or branching; distichous, oblong to oblong-lanceolate, 1.2-1.4 mm. long, about 0.45 mm. wide, vaginant lamina boat-shaped, flat, conduplicate, 1/2-2/3 length of leaf, clasping stem and usually a portion of adjacent leaf above, costa slender, 40 μ wide at base, subpercurrent, apices rounded obtuse and apiculate to broadly acute, dorsal lamina rounded at base, not undulate, margins entire to finely crenulate below, finely and evenly crenulate-serrate above by projecting cell angles; median cells of superior lamina opaque, slightly rounded to rounded hexagonal, small, 6-10 μ in diameter, walls incrassate, cells of superior lamina usually minutely pluripapillose, rarely smooth, marginal cells not at all translucent to very slightly so, border cells or lighter-colored cells lacking; monoicous; calyptra small, conical; sporophyte lateral from near base of plant; seta golden, reddish yellow, or reddish brown, short, 6-9 mm. long; capsule erect, brown to reddish brown, short, 6-9 mm. long; operculum conic, rostrate; urn ovoid, about 1.2 mm. long, contracted beneath mouth when dry and empty; annulus present, peristome single, teeth 16, cleft to approximate middle into 2 subulate, trabeculate, appendiculate divisions, marked with fine longitudinal lines, slightly papillose; spores brownish, 15-20 μ in diameter, finely papillose to smooth, mature in summer.

Habitat: On soil.

Illinois distribution: Shelby County.

Fissidens bushii (Card. & Ther.) Card. & Ther.

Fig. A - Leaf - 40 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

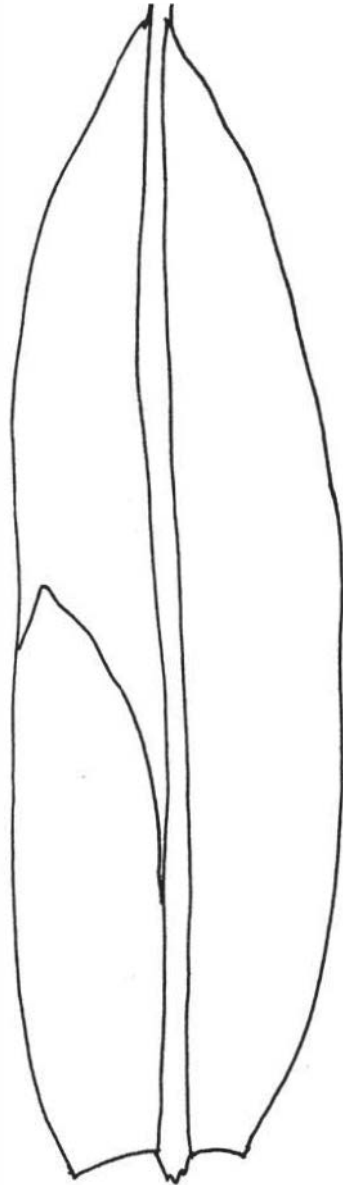


FIG. A

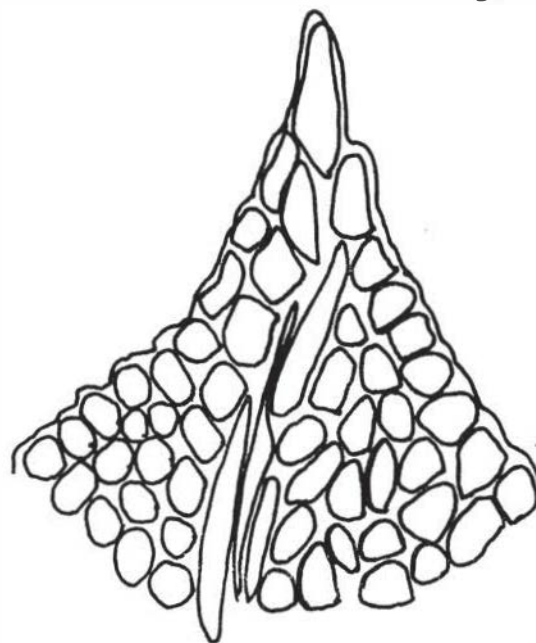


FIG. B

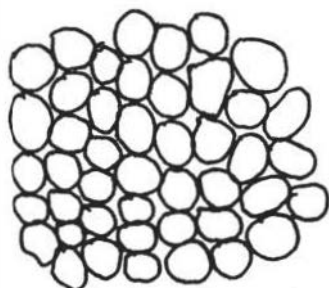


FIG. C

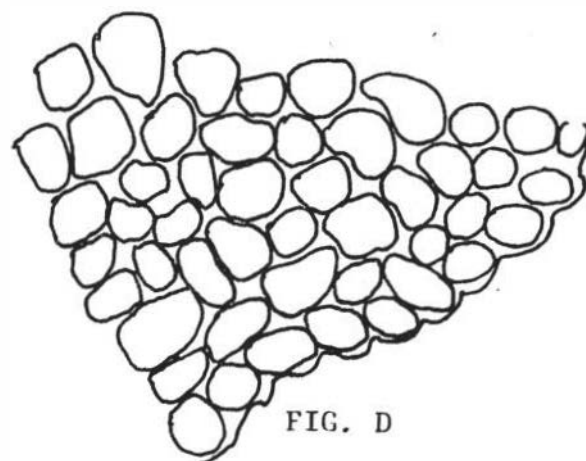


FIG. D

FAMILY: FISSIDENTACEAE

Fissidens exiguus Sull.

Plants very small, gregarious, light green; stems erect or ascending, 1-2.5 mm. high, simple; leaves distichous, 3-6 pairs, narrowly oblong-lanceolate, the upper leaves 1-1.5 mm. long, ascending to erect, vaginant lamina boat-shaped, flat, conduplicate, about 1/2 length of leaf, clasping stem and usually a portion of adjacent leaf above, costa strong, usually disappearing 2-3 cells below apex of blade, dorsal lamina narrow to none at base, apices acute to rounded obtuse, margins entire, border of 1-4 rows of narrow, elongated, rather incrassate cells, mostly only on vaginant lamina of stem and perichaetial leaves, occasional plants with very narrow border of the dorsal and vertical laminae; cells of leaves smooth, median cells of leaves smooth, median cells of superior lamina quadrate to irregularly rounded hexagonal, 8-15 μ in longest dimension, the basal cells rectangular; dioicous; calyptra small, narrowly conical, split on one side; sporophyte terminal; seta pale to reddish, 2-5 mm. long; capsule erect and symmetric to slightly inclined, operculum long conic to short rostrate, about 2/3 length of urn; the urn reddish yellow, oblong-ovoid, 0.5-0.7 mm. long, smooth, contracted below mouth when dry and empty, narrowed to seta; annulus present; peristome single, teeth red, 16, cleft from apex to approximate middle into 2 subulate, spirally thickened, finely papillose divisions; spores spherical, 15-20 μ in diameter, mature in summer.

Habitat: On stones, in moist, shaded places; especially in ravines.

Illinois distribution: Clark, Coles, Cook, Shelby, and Will Counties.

Fissidens exiguus Sull.

Fig. A - Leaf - 40 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

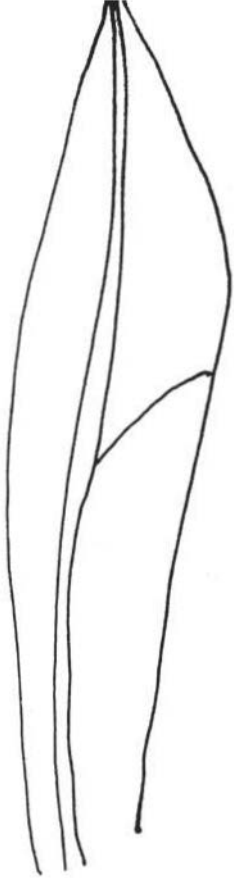


FIG. A

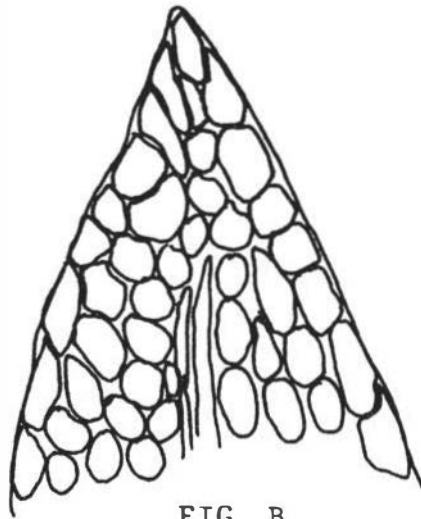


FIG. B

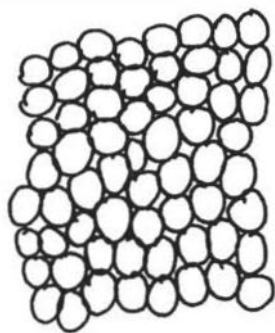


FIG. C

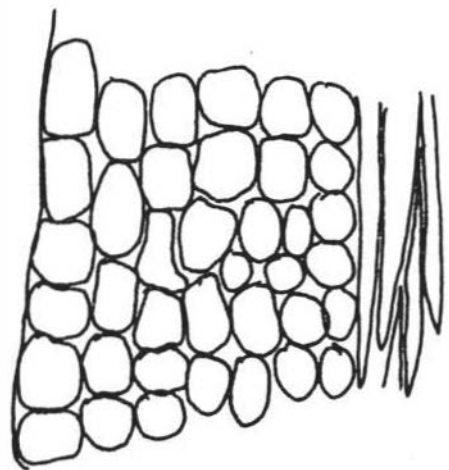


FIG. D

FAMILY: FISSIDENTACEAE

Fissidens minutulus Sull.

Plants very small or minute, gregarious, green; stems erect, 0.8-3 mm. long, occasionally up to 5 mm., leaves usually in 3-5 pairs, sometimes up to 7 pairs, scarcely imbricate, distichous, increasing in size from base to apex of stem, the perichaetial and the upper narrowly lanceolate, erect, incurved, upper leaves mostly up to 1-2 mm. long, occasionally up to 1.5 mm. long, 0.24-0.3 mm. wide, occasionally up to 0.45 mm., vaginant lamina boat-shaped, flat, conduplicate, about 1/2 length of leaf, clasping stem and frequently a portion of adjacent leaf above, the sides sometimes unequal, costa strong, usually ending a little below apex, percurrent in upper leaves, dorsal or inferior lamina narrowed at base, extending to stem in upper leaves but usually not in the lower, apices acute, margins entire below, usually somewhat irregular in apical portion, border narrow, of 1-3 rows of narrowly linear cells, occasionally up to 5 rows, usually ending below apex; cells of leaves incrassate, median irregularly quadrate, varying greatly in shape and size, 8-15 μ in diameter, cells of vaginant, superior and inferior laminae about the same size; dioicous; calyptra small, narrowly conical, sporophyte terminal; seta yellowish or reddish, erect, 2-6 mm. long; capsule yellowish to dark chestnut color, usually erect, symmetric; operculum conic, apiculate to rostrate, approximate length of urn; the urn oval-oblong, 0.7-0.9 mm. long, often shorter, contracted beneath mouth when dry and empty, tapering abruptly at base; peristome dark red to chestnut color, single, teeth 16, deeply

cleft into 2 subulate divisions, spirally thickened, densely papillose; spores pellucid, pale yellowish red, spherical, 14-17 μ in diameter, smooth or nearly so, mature in autumn.

Habitat: Usually on damp or wet rock, in cool, shaded places; occasionally on moist banks.

Illinois distribution: Clark, Coles, Fulton, Menard, and Shelby Counties.

Fissidens minutulus Sull.

Fig. A - Leaf - 40 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

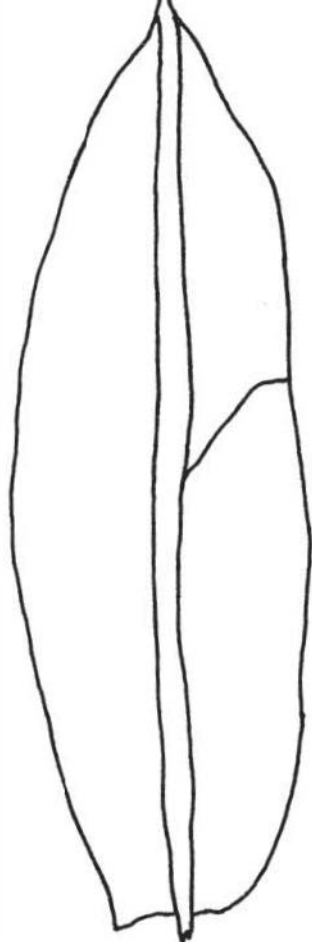


FIG. A

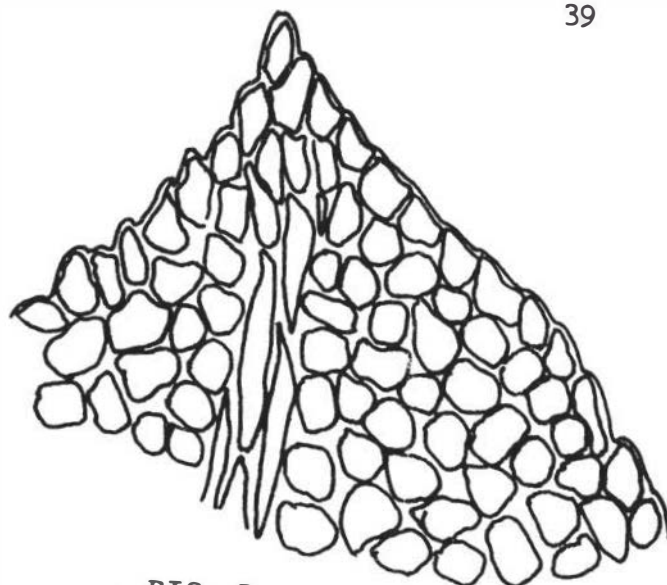


FIG. B

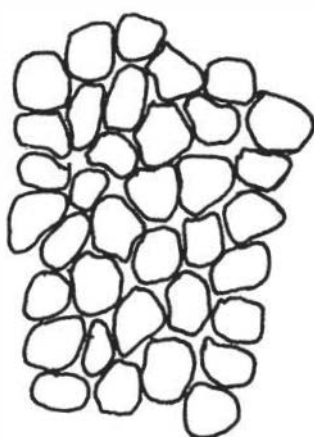


FIG. C

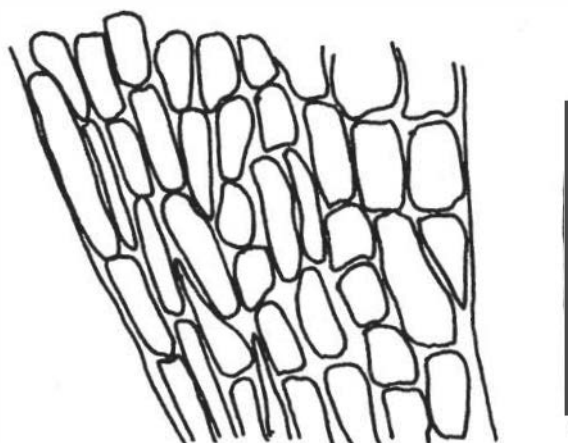


FIG. D

FAMILY: FISSIDENTACEAE

Fissidens taxifolius Hedw.

Plants small, gregarious, light green when young; dark green with age; stems erect to ascending; usually 5-20 mm. high, sometimes up to 2 cm.; sparingly branched from the base; leaves of stems distichous, close, in many pairs, ascending, oblong-cultriform, oblong-ovate, the median longest; up to 2 mm. in length, vaginant lamina boat-shaped, flat, conduplicate, $1/2$ - $1/4$ length of leaf, clasping as stem and portion of adjacent leaf above, costa strong, widening at apex and consisting of elongated parenchymatous cells, usually filling the short apiculus, in mature leaves excurrent into a short mucro, in lower and immature leaves percurrent to excurrent, dorsal lamina ending abruptly, usually reaching stem and somewhat decurrent, apices rounded obtuse, apiculate to subacute, margins finely and evenly crenulate throughout with projecting cell angles, border absent; median cells of superior lamina incrassate, rounded hexagonal, mostly 7-10 μ in diameter, one or two rows along costa larger, marginal cells smaller and the outer row paler and more pellucid, basal cells of superior lamina and especially those near costa conspicuously ~~mammillose~~ to conically papillose; autoicous; calyptra cucullate, covering about $1/2$ the urn; sporophyte later, arising near base of stem; seta yellowish to red, or castaneous, ascending, 8-15 mm. long; capsule castaneous to dark brown, erect to subpendulous, usually slightly curved and unsymmetric; operculum conic; obliquely rostrate, the beak about $1/2$ length of capsule to as long as urn; urn oblong, about 1.5 mm. long, contracted beneath mouth

when dry and empty, tapering abruptly to the seta; annulus of 1-2 rows of cells; peristome red chestnut to red, single, teeth 16, up to 0.55 mm. long, cleft from apex $3/4$ their length into 2 subacute divisions, strongly nodulose, marked with very fine oblique lines between nodes, papillose; spores pale yellowish pellucid, spherical, 12-20 μ in diameter, smooth, mature in late fall or winter.

Habitat: On damp, shaded soil, especially clay.

Illinois distribution: Clark, Coles, Cook, Effingham, Fulton, Menard, Peoria, and Shelby Counties.

Fissidens taxifolius Hedw.

Fig. A - Leaf - 40 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

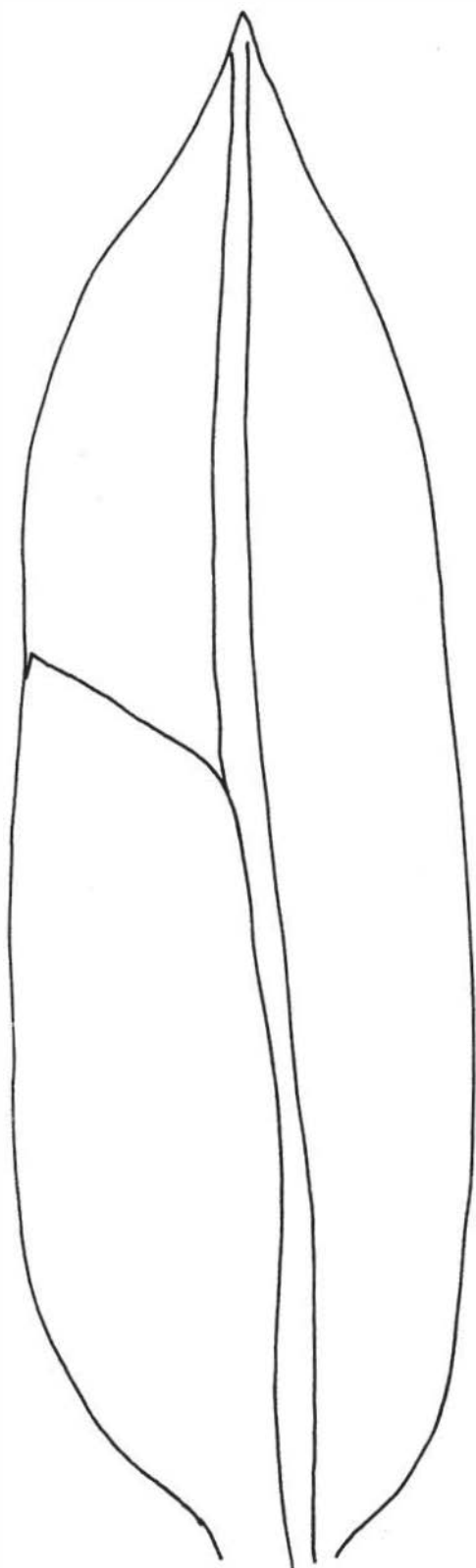


FIG. A

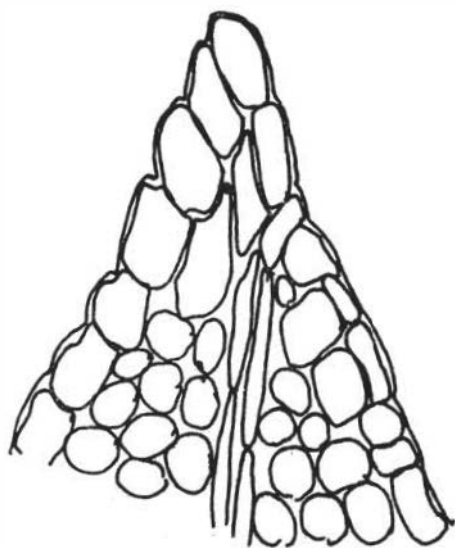


FIG. B

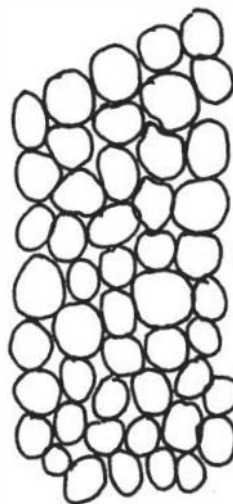


FIG. C

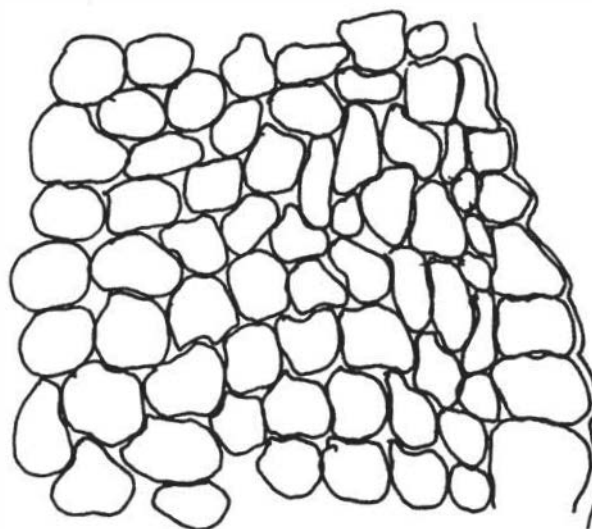


FIG. D

FAMILY: DITRICHACEAE

Ceratodon purpureus (Hedw.) Brid.

Plants perennial, caespitose, in wide mats, green above when young, brownish or reddish with age; stems erect usually 1-2 cm. long, occasionally up to 5 cm. or more, often branched; leaves rather loosely imbricated, slightly twisted to crispate and appressed when dry, erect-spreading when moist, broadly triangular-ovate, ovate-lanceolate, and lanceolate, the upper to 2 mm. long, the lower shorter and more distinct, concave to carinate, costa strong, at base $1/6$ - $1/4$ width of leaf, percurrent to briefly excurrent, apices acute to acuminate, margins revolute and entire from base to near the apex, becoming serrate in the apex; all cells usually smooth, median cells regularly quadrate, hexagonal-quadrate, or irregular, short, small, 8-10 μ wide, thick-walled; perichaetial leaves sheathing; dioicous; calyptra cucullate; seta dark reddish brown, erect, 1-2.5 cm. long, occasionally up to 3.5 cm.; capsule dark reddish brown, erect when young, inclined to horizontal when mature; operculum elongate conic, about $1/4$ length of urn, conic, about $1/4$ length of urn, often curved downward; urn oblong to oblong-ovoid, 2-2.5 mm. long, straight or slightly curved, sulcate and 4-5 angled when dry, with a small but distinct struma at base; annulus distinct, of 2-3 rows of cells, deciduous; peristome single, teeth dark red below, 16, hyaline above, papillose, confluent at the base, bifid nearly to base into 32 filiform, nodose divisions; spores yellowish pellucid, 10-16 μ in diameter, smooth, mature spring to summer.

Habitat: On bare compact soil, sand, along paths, roadsides, in vacant lots, lawns, over burnt-over ground, old roofs, old wooden platforms of wells, walls, sidewalks, and also in swamps.

Illinois distribution: Champaign, Clark, Coles, Cook, Fulton, Henderson, Lake, LaSalle, Lee, McDonough, Menard, Peoria, Shelby, Stark, and Will Counties.

Ceratodon purpureus (Hedw.) Grout

Fig. A - Leaf - 40 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

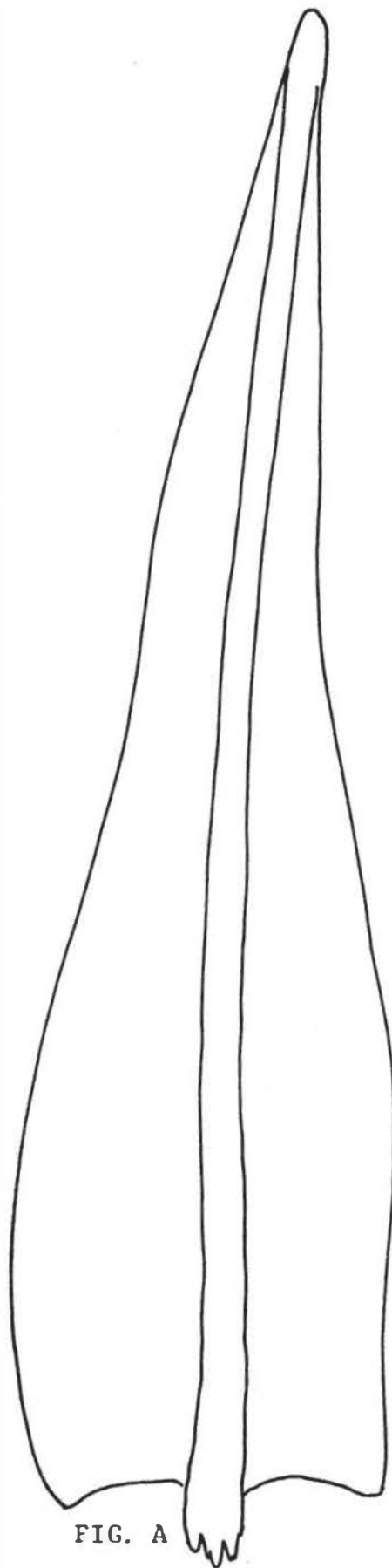


FIG. A

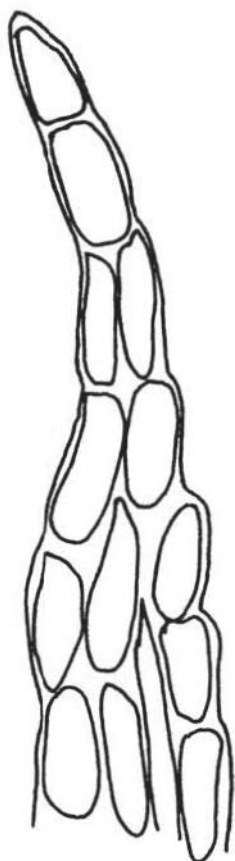


FIG. B

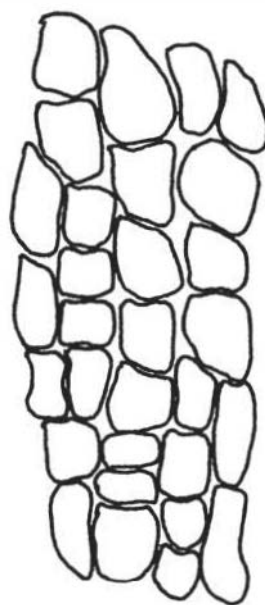


FIG. B

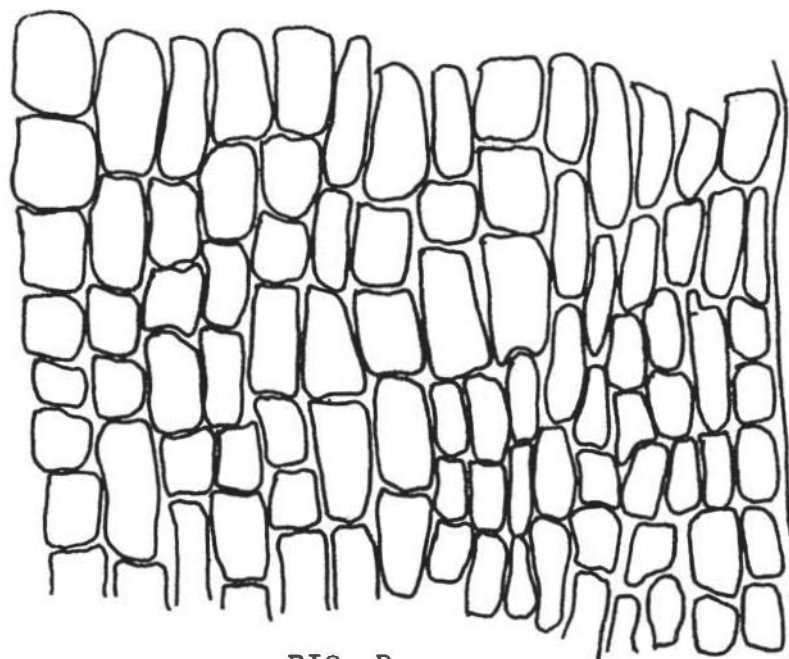


FIG. D

FAMILY: DITRICHACEAE

Ditrichum pallidum (Hedw.) Hampe

Plants small, caespitose or gregarious, green or yellow green; stems erect or nearly so, from a prostrate base, short, about 5 mm. long, usually simple; leaves of stems slightly contorted when dry, erect-spreading, secund, long linear-subulate from a lanceolate or ovate base, 3-5 mm. long, concave below, channeled above, costa strong, long excurrent, serrulate toward apex, margins distantly serrulate in upper part of base; median cells rectangular, thin-walled, smooth, composing a narrow margin on either side of costa, basal cells oblong-hexagonal; parietal cells cucullate, slenderly rostrate, straight, smooth, up to 2.5 mm. long; seta orange, erect, slender, 1-4 cm. long; capsule light brown, ascending to inclined; operculum conic, obtuse, 0.6-1 mm. long, urn slightly unsymmetric, oblong-ovoid, 1-2.5 mm. long, narrowed near mouth, faintly strumose at base; annulus of 1-3 rows of cells, deciduous; peristome single, reddish, teeth 16, about 0.5 mm., deeply bifid into filiform; spores brownish, spherical, 14-18 μ in diameter, papillose to coarsely warty, mature in early spring.

Habitat: On dry, sandy soil, especially in fields, or on bare soil in woods.

Illinois distribution: Champaign, Christian, Clark, Coles, Cook, Effingham, Fulton, Johnson, Lake, Menard, Peoria, Pope, Saline, Shelby, and Wabash Counties.

Ditrichum pallidum (Hedw.) Hampe

Fig. A - Leaf - 40 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

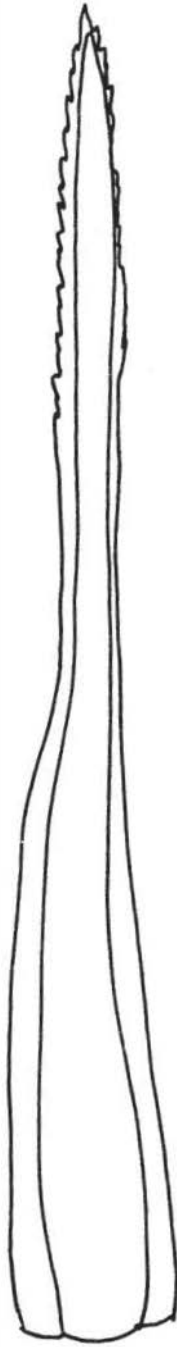


FIG. A



FIG. B

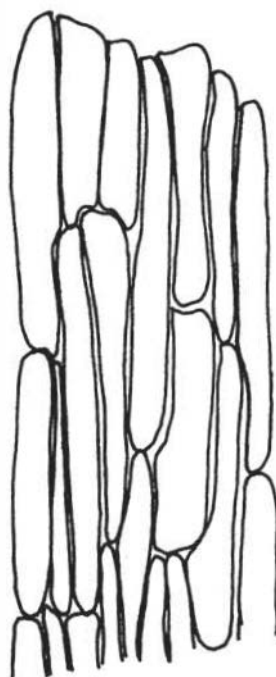


FIG. C

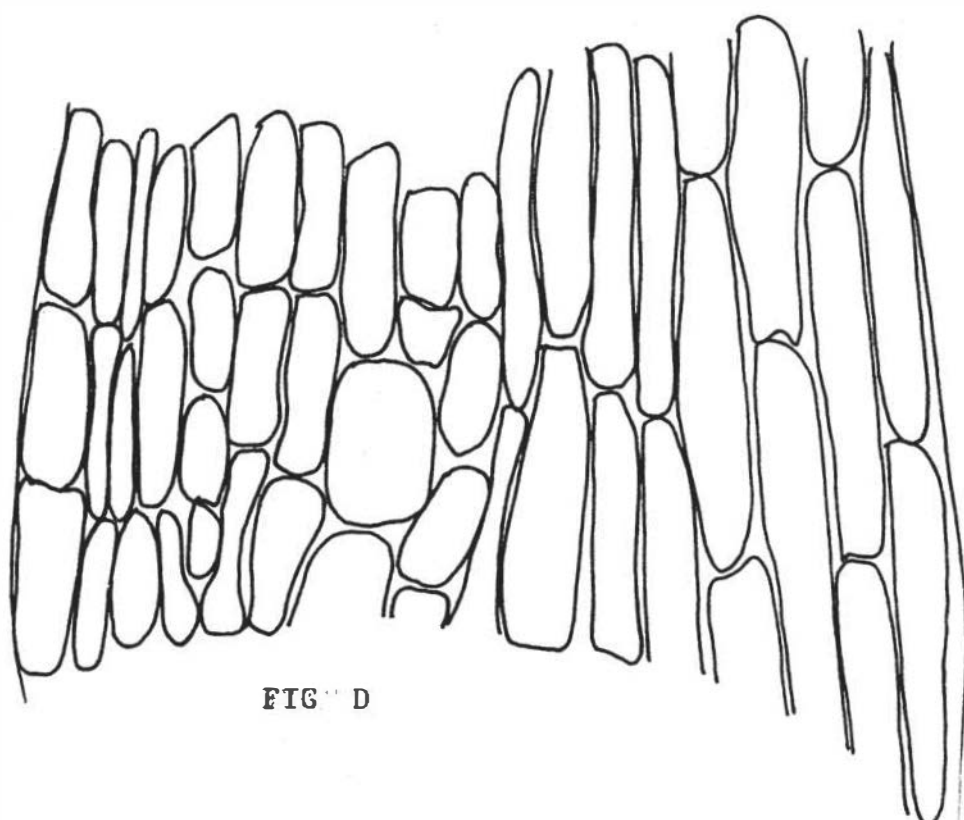


FIG. D

FAMILY: DITRICHACEAE

Pleuridium subulatum (Hedw.) Lindb.

Plants minute, densely gregarious to cespitose, in sods, yellow green; stems erect, short, 2-6 mm. high, usually simple; lower leaves of stems distant, slightly spreading, lanceolate-subulate, short, 0.5-1.5 mm. long, the upper leaves erect-spreading to subsecund, long and gradually subulate-acuminate from an ovate or lanceolate base about $\frac{1}{3}$ length of blade, 3-4 mm. long, concave, costa percurrent, wide, often occupying $\frac{1}{3}$ the base and all the apex, apices canaliculate, subulate-setaceous, the awn more or less papillose, margins of blade entire throughout or minutely denticulate, frequently serrulate in the awn; cells of leaves not papillose, basal cells rectangular to oblong-hexagonal, upper cells linear, alar cells not enlarged or inflated; autoicous to pariocous; calyptra cucullate, short rostrate, split on one side almost to apex; seta erect, very short, 0.4-1 mm.; capsule erect, immersed in perichaetial leaves, yellowish brown or reddish, without operculum and neck, ovoid, about 1 mm. long, apiculate with a blunt point; peristome none; spores large, about 28 μ in diameter, minutely papillose, mature in late spring to early summer.

Habitat: On moist clay or sandy soil in old fields and on ditch banks.

Illinois distribution: Clark, Coles, Cumberland, Fulton, Menard, Peoria, and Shelby Counties.

Pleuridium subulatum (Hedw.) Lindb.

Fig. A - Leaf - 160 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

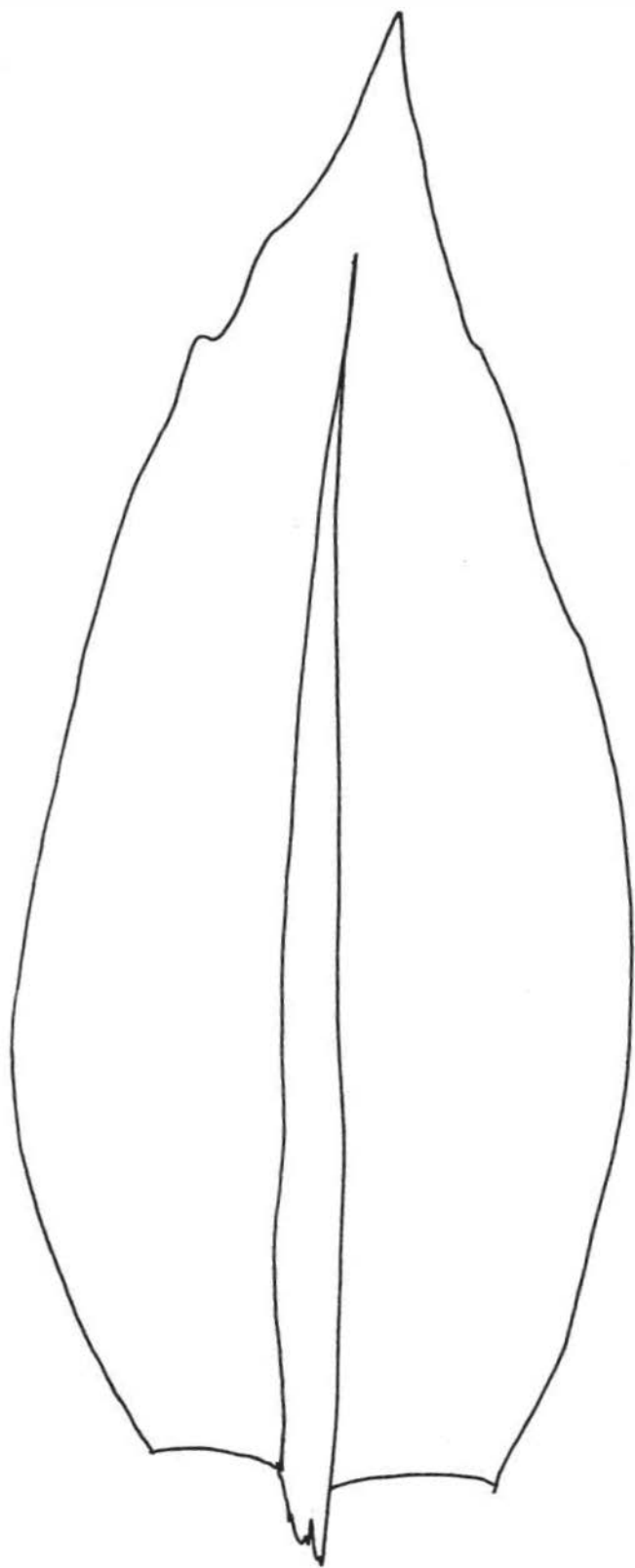
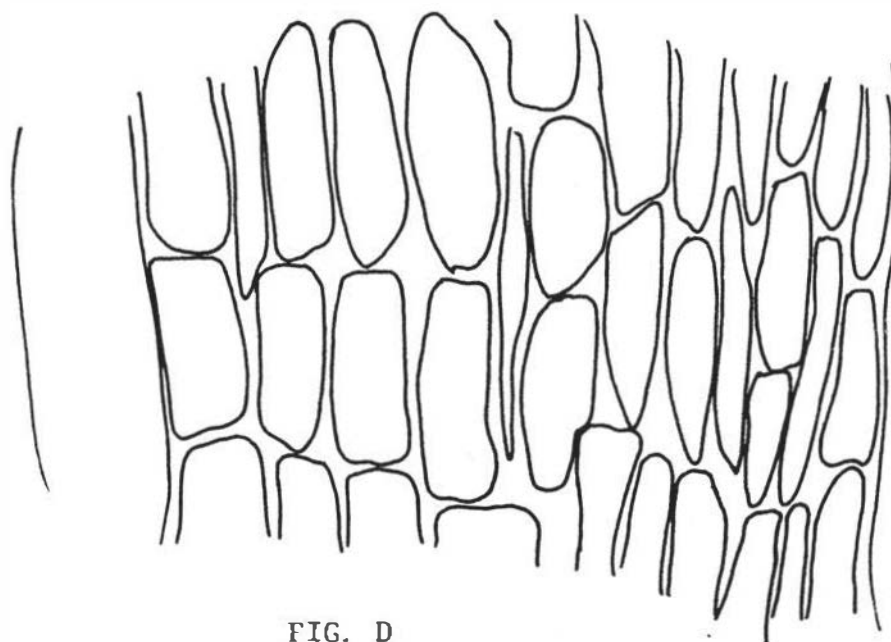
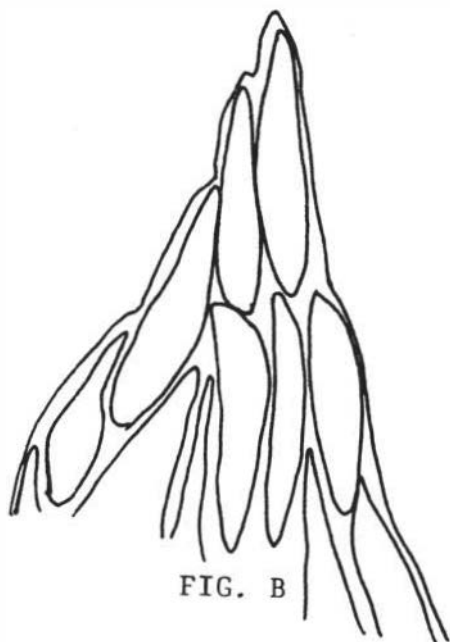


FIG. A



FAMILY: DICRANACEAE

Dicranella heteromalla (Hedw.) Schimp.

Plants small, glossy, in wide mats, dark green, stems erect to ascending, 0.5-4 cm. long, frequently branched; leaves numerous, generally falcate-secund, rarely erect spreading, ovate-lanceolate to lanceolate, upper part of blade subulate, broadest at attachment to stem and gradually narrowing to a filiform, channelled, rough awn, 2-4 mm. long, upper half of leaf toothed on lower surface, concave below, costa percurrent, broad, often $1/4$ - $1/3$ of width of leaf base, leaf margins plane, usually entire below and slightly to strongly denticulate above, with a few teeth at the point; median cells short rectangular or rectangular-oblong, with oblique end walls, alar cells not differentiated or only slightly so; dioicous; calyptra cucullate; seta usually greenish yellow to pale yellow, erect to curved, 0.5-3 cm. long; capsule more or less inclined; operculum convex, long and obliquely rostrate, beak 1-1.5 cm. long, curved downward; urn castaneous to dark brown, glossy, unsymmetric, ovoid to oblong-cylindric, strongly sulcate when dry and empty, contracted beneath mouth much more strongly on one side, 1-1.5 mm. long; annulus poorly developed; peristome single, papillose, teeth 16, dark red, about 1.4 mm. long, 2-3 cleft to middle or below, strongly striate below the subulate divisions; spores yellowish, 10-15 μ in diameter, mature in autumn to winter.

Habitat: On moist clay and sandy banks, roadsides, and on soil covered logs and rocks, in shaded places.

Illinois distribution: Clark, Coles, Cook, Fulton, Jackson, LaSalle, McDonough, Menard, Ogle, Peoria, and Shelby Counties.

Dicranella heteromalla (Hedw.) Schimp.

Fig. A - Leaf - 40 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

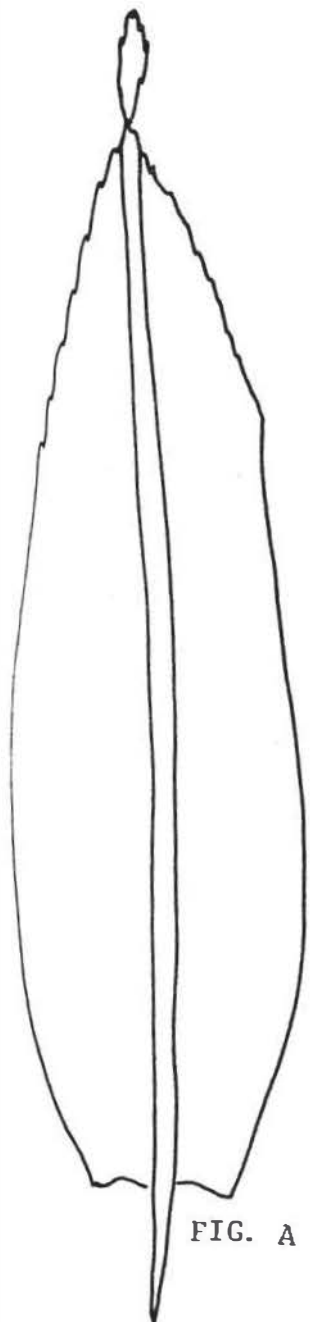


FIG. A

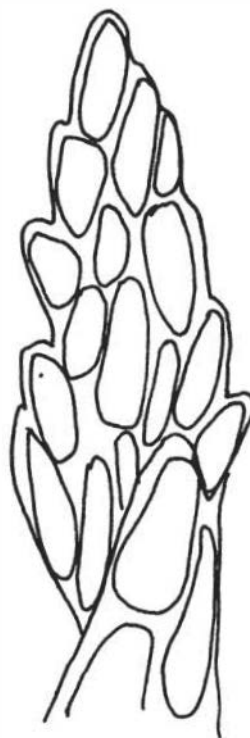


FIG. B

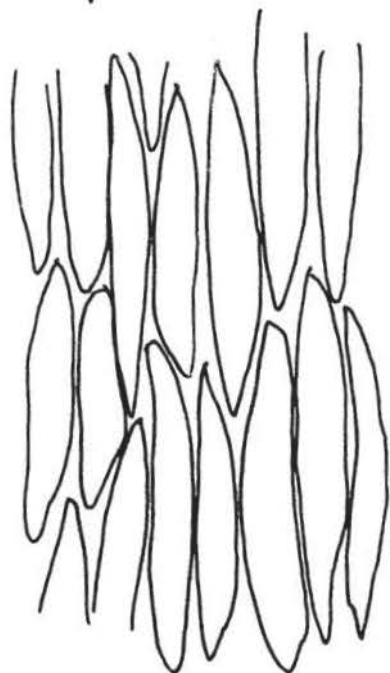


FIG. C

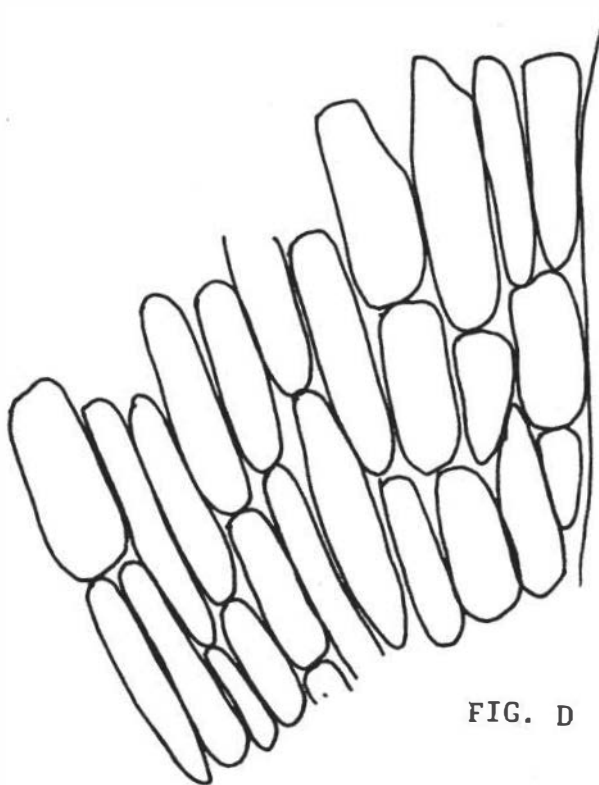


FIG. D

FAMILY: DICRANACEAE

Dicranella varia (Hedw.) Schimp.

Plants in loose tufts, bright green or yellowish green; stems erect to ascending, 5-10 mm. long, sometimes higher, branching below; leaves recurved, linear-lanceolate, lower about 1 mm. long, upper 1.5-2 mm. long, concave below, plane above, costa about 1/5 width of leaf base, composing a large portion of the acumen, apices slenderly acute to narrowly obtuse, margins narrowly revolute, entire throughout, denticulate at the base, median cells of upper leaves narrowly rectangular, 4-6 μ wide, upper cells bistratose, alar cells not differentiated; dioicous; calyptra cucullate; seta reddish or castaneous, erect, 5-10 mm. long, capsule reddish to light castaneous, more or less cernous; operculum rostrate, approximately the length of the urn; the urn ovoid to short oblong, usually less than 1 mm. long, curved; annulus none; peristome red, single, teeth, 16, lance-subulate, up to 0.4 mm. long; spores yellowish, 18-24 μ in diameter, mature in late autumn or winter.

Habitat: On moist clay soil, banks of ditches, and sometimes in crevices of rocks, in fields and woods.

Illinois distribution: Clark, Coles, Cook, Fulton, Henderson, Jackson, Lake, Marion, Menard, Peoria, Shelby, and Will Counties.

Dicranella varia (Hedw.) Schimp.

Fig. A - Leaf - 40 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Median cells - 400 X.

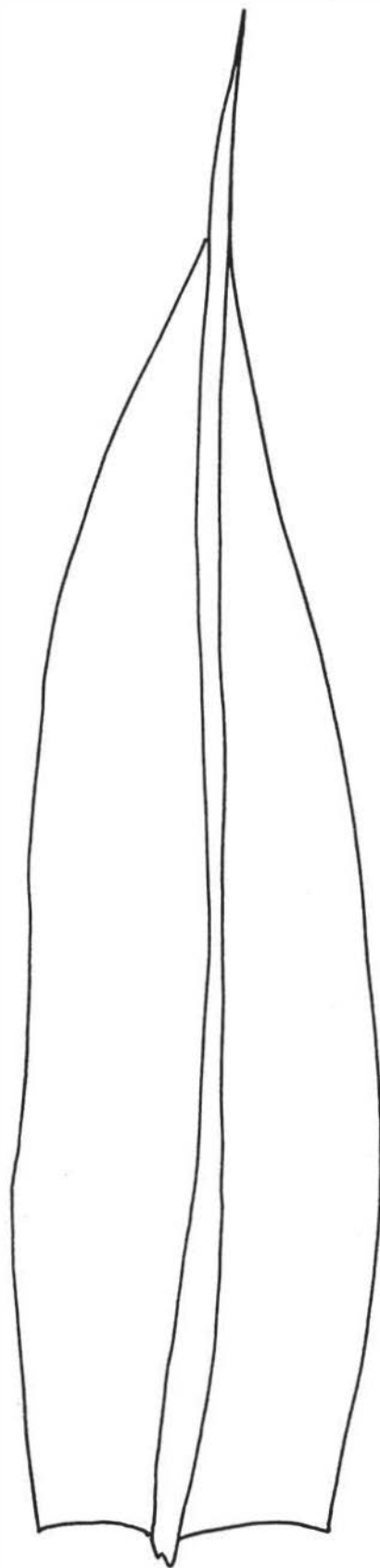
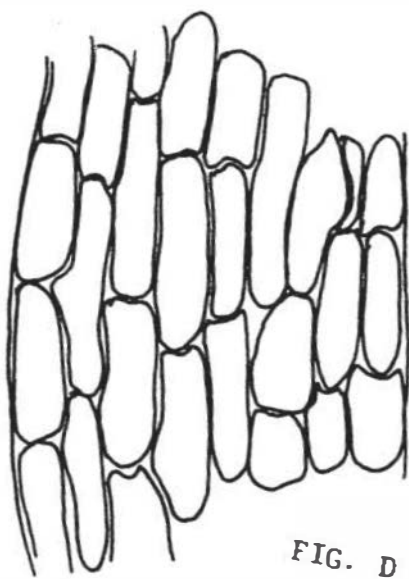
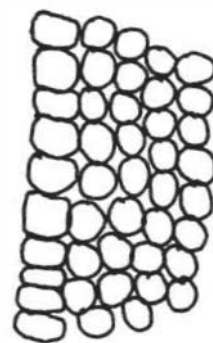
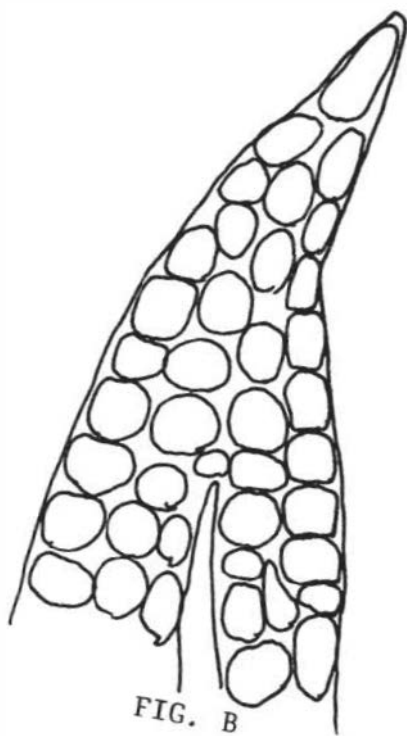


FIG. A



FAMILY: DICRANACEAE

Dicranum scoparium Hedw.

Plants large, loosely tufted, in wide sods, glossy, brownish below, stems erect, 2-10 cm. high; leaves of stems strongly falcate-secund, narrowly lanceolate, 4-9 mm. long, sometimes up to 12 mm., concave below, subtubulose above, costa strong, at base $1/4$ - $1/3$ width of leaf, ending in apex, in upper part with 2-4 rather prominent, serrulate lamellae, apices long, narrowly subulate, margins of approximate upper $1/2$ strongly serrate, entire below; leaf cells elongate and more or less porose; median cells elongate-rectangular incrassate, the alar inflated, orange brown, not extending to the costa; dioicous; calyptra cucullate, conic-rostrate, 6-7 mm. long; seta reddish brown, erect, solitary, 2.5-4 cm. long, inclined, operculum low conic, long rostrate, beak often oblique, about 2.5 mm. long; urn cylindric, arcuate, 3-4 mm. long, 0.8 mm. in diameter, usually neck distinct, short; annulus none; peristome reddish brown, single, teeth 16, cleft from apices to middle; spores spherical, slightly rough, 20-24 μ in diameter, mature in late summer to autumn.

Habitat: On soil, rock and decaying wood, in shaded places.

Illinois distribution: Clark, Coles, Cook, Fulton, Jackson, Johnson, Menard, Peoria, Pope, Randolph, Sangamon, and Shelby Counties.

Dicranum scoparium Hedw.

Fig. A - Leaf - 26.5 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 260 X.

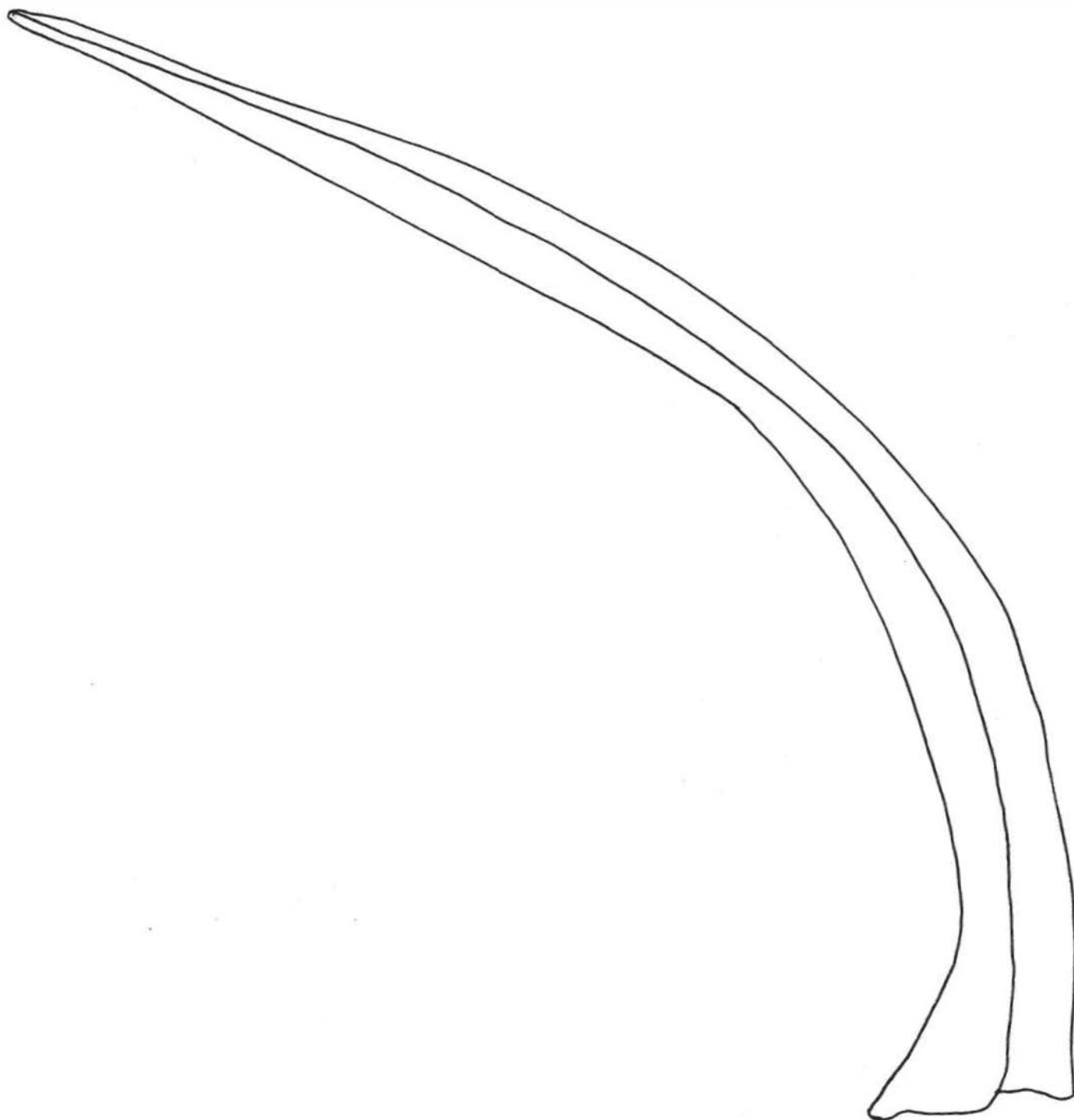


FIG. A

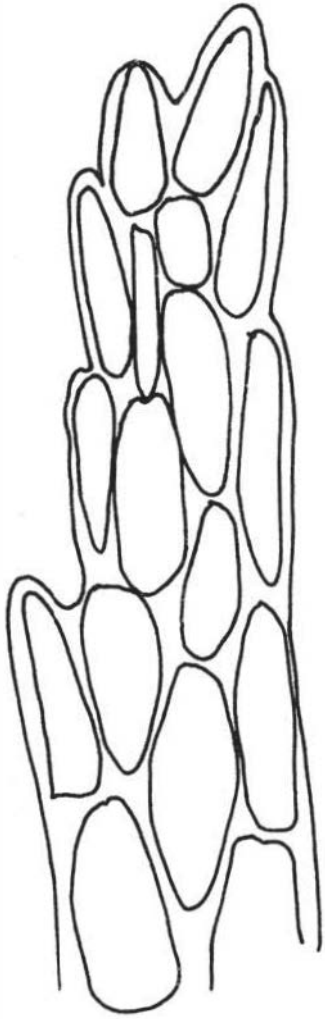


FIG. B

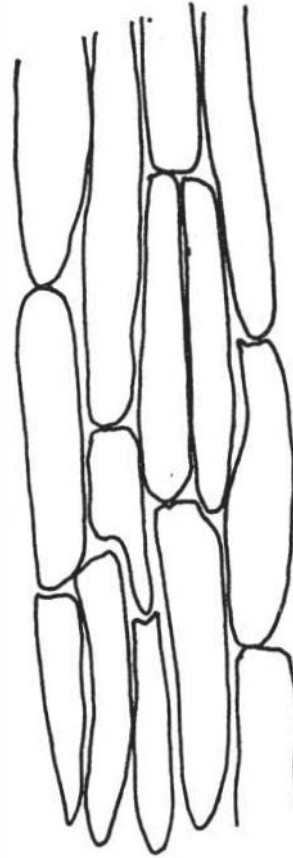
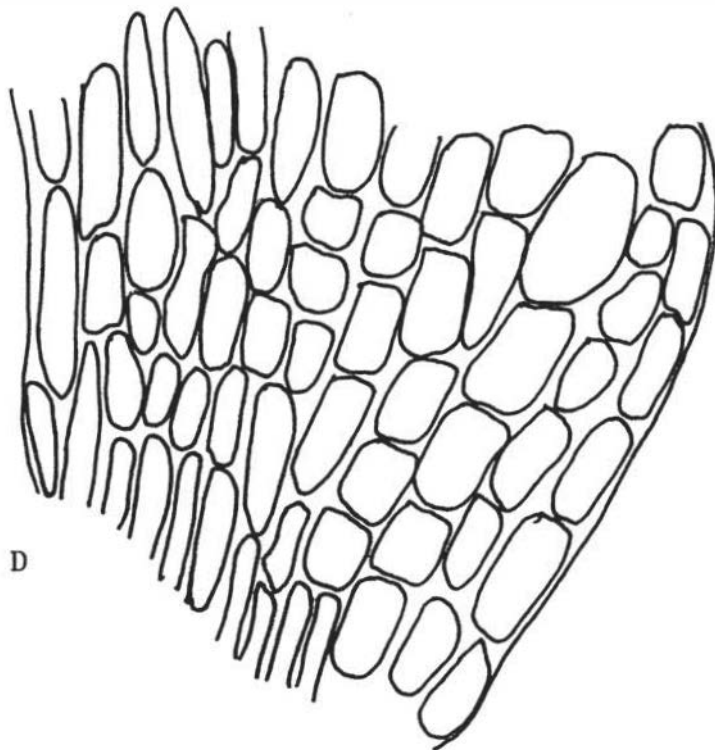


FIG. C



FIG. D



FAMILY: LEUCOBRYACEAE

Leucobryum glaucum (Hedw.) Schimp.

Plants robust, in dense, spongy, rounded, glaucous cushions, upper portion alive, lower portion dead, grayish brown, peaty, stems very fragile, erect, dichotomously forked, often 6-7 cm. high, leaves erect-appressed, crowded, in many rows, oblong-lanceolate, concave, 3-10 mm. long, from an oblong base gradually narrowed to a narrower subtubular portion, consisting almost entirely of the broad thick costa, the hyaline lamina on each side of midrib up to several rows on linear, thick walled cells, costa in cross-section, consisting of two kinds of cells, central chlorocyst cells with leucocysts above and below, apices acute, margins entire, but slightly denticulate at the tip; dioicous; calyptra inflated, cucullate, longer than the urn; seta erect, castaneous; operculum long rostrate from a conical base, 1.5-2 mm. long, urn oblong to cylindric; peristome dark red to reddish brown, single, teeth 16, lanceolate, united at base into a tube, cleft from above to the middle into 2 lance-subulate prongs, vertically striate and papillose; spores slightly roughened 15-20 μ in diameter, mature in autumn.

Habitat: On soil or rocks, in shaded places, especially in moist or swampy woods, but often found in drier conditions.

Illinois distribution: Clark, Coles, Cook, Fulton, Jackson, LaSalle, Menard, Peoria, Randolph, Shelby, and Union Counties.

Leucobryum glaucum (Hedw.) Schimp.

Fig. A - Leaf - 42 X.

Fig. B - Apical cells - 104 X.

Fig. C - Median cells - 104 X.

Fig. D - Alar cells - 104 X.

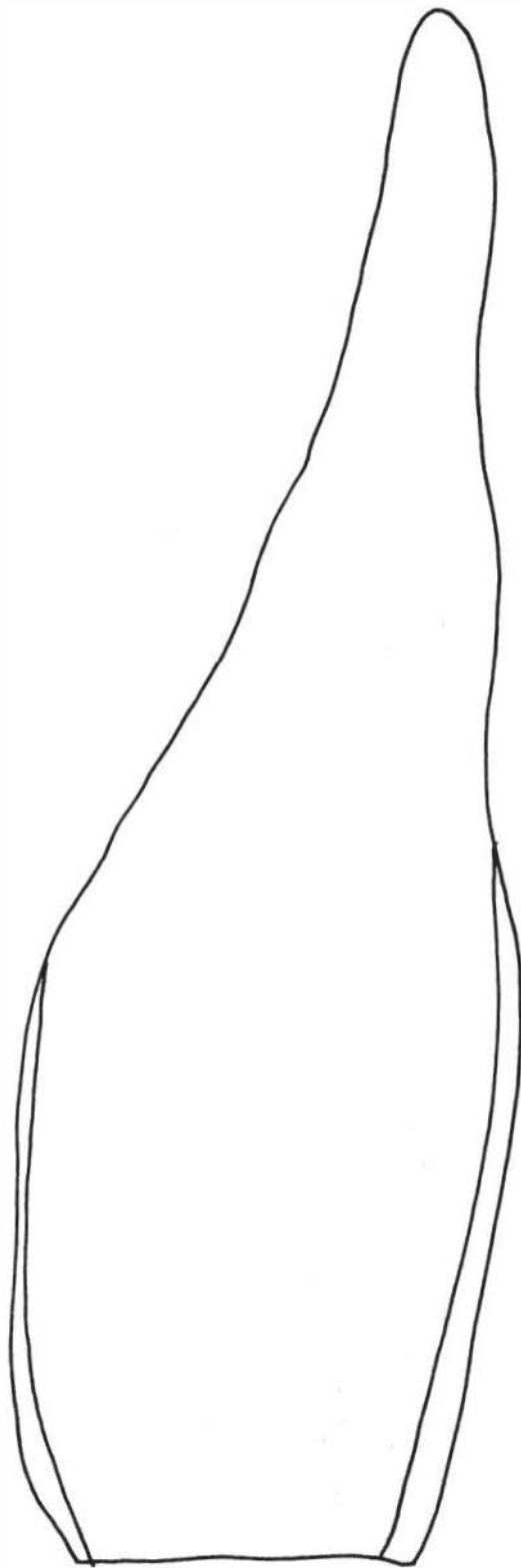


FIG. A

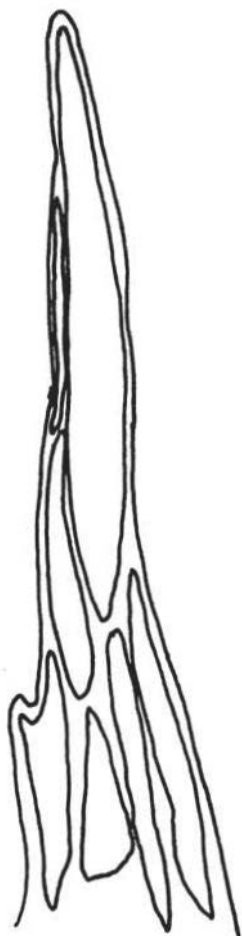


FIG. B

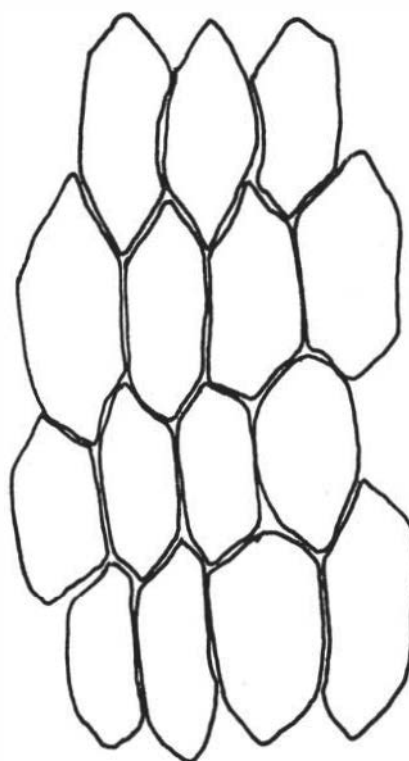


FIG. C

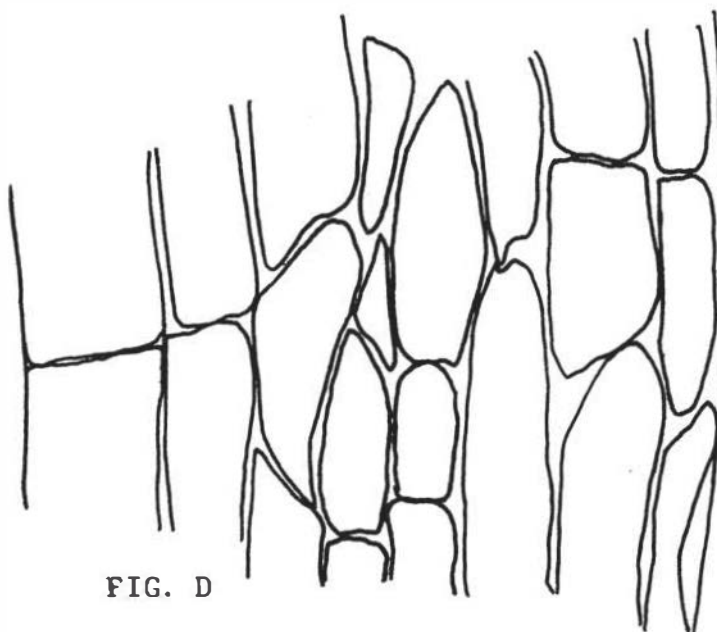


FIG. D

FAMILY: POTTIACEAE

Barbula unguiculata Hedw.

Plants densely cespitose, glaucous-green, or yellowish green; stems erect, usually 0.5-1 cm. high rarely up to 2-3 cm., branching; leaves appressed and variously contorted when dry, sometimes spirally twisted, erect-spreading to recurved or somewhat squarrose when moist, oblong-lanceolate to lingulate from an ovate base, up to 2.5 mm. long, slightly keeled below and plane above; costa strong, excurrent as a short, yellow, rounded mucro, very papillose on lower surface, in cross section showing 2-6 central guide cells and two stereid bands, apices generally obtuse, margins entire, recurved in basal half, plane above; upper cells of leaves small, 8-10 μ in diameter, rounded quadrate, incrassate, densely papillose, very obscure, the basal elongate-rectangular, yellowish pellucid to somewhat hyaline; propagula absent; dioicous; calyptra cucullate, with long beak, covering about 1/3 of the urn; seta dark red, erect, 0.5-2.5 cm. long; capsule dark castaneous, erect; operculum conic, rostrate, about 1/3-1/2 as long as urn, beak straight to slightly curved; urn oblong cylindric, about 1.8 mm. long, rather smooth when dry and empty; annulus absent; peristome dark, clear red, teeth 16, cleft into 32 long, filiform, papillose divisions, twisted in at least two complete spiral turns, basal membrane narrow; spores yellowish, smooth, 9-12 μ in diameter, maturing in winter to early spring.

Habitat: On moist soil, especially calcareous, and that which is disturbed periodically, as in fields, old paths, on roadside banks; also on stones and walls, but usually not on the vertical faces.

Illinois distribution: Clark, Coles, Cook, Henderson, Lake,
Menard, Peoria, and Shelby Counties.

Barbula unigiculata Hedw.

Fig. A - Leaf - 40 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

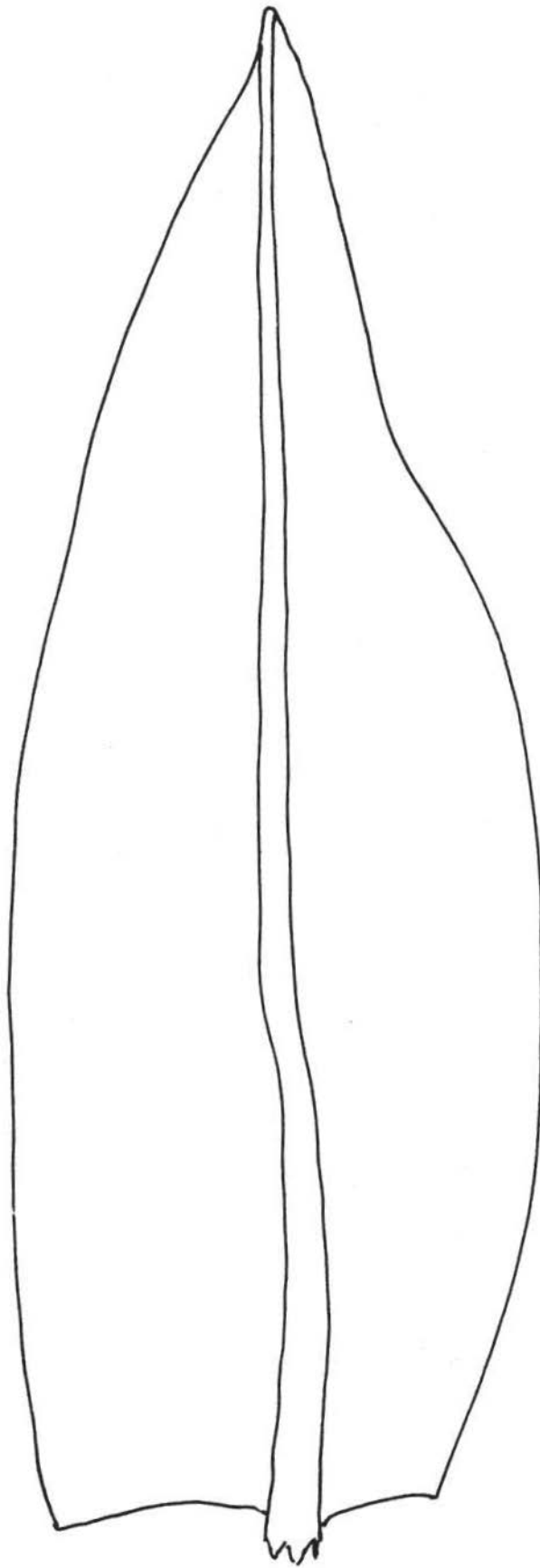


FIG. A

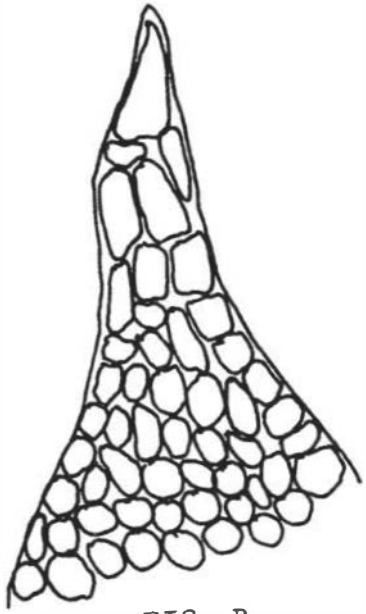


FIG. B

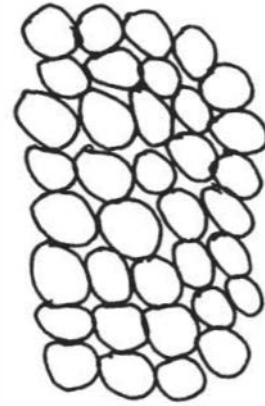


FIG. C

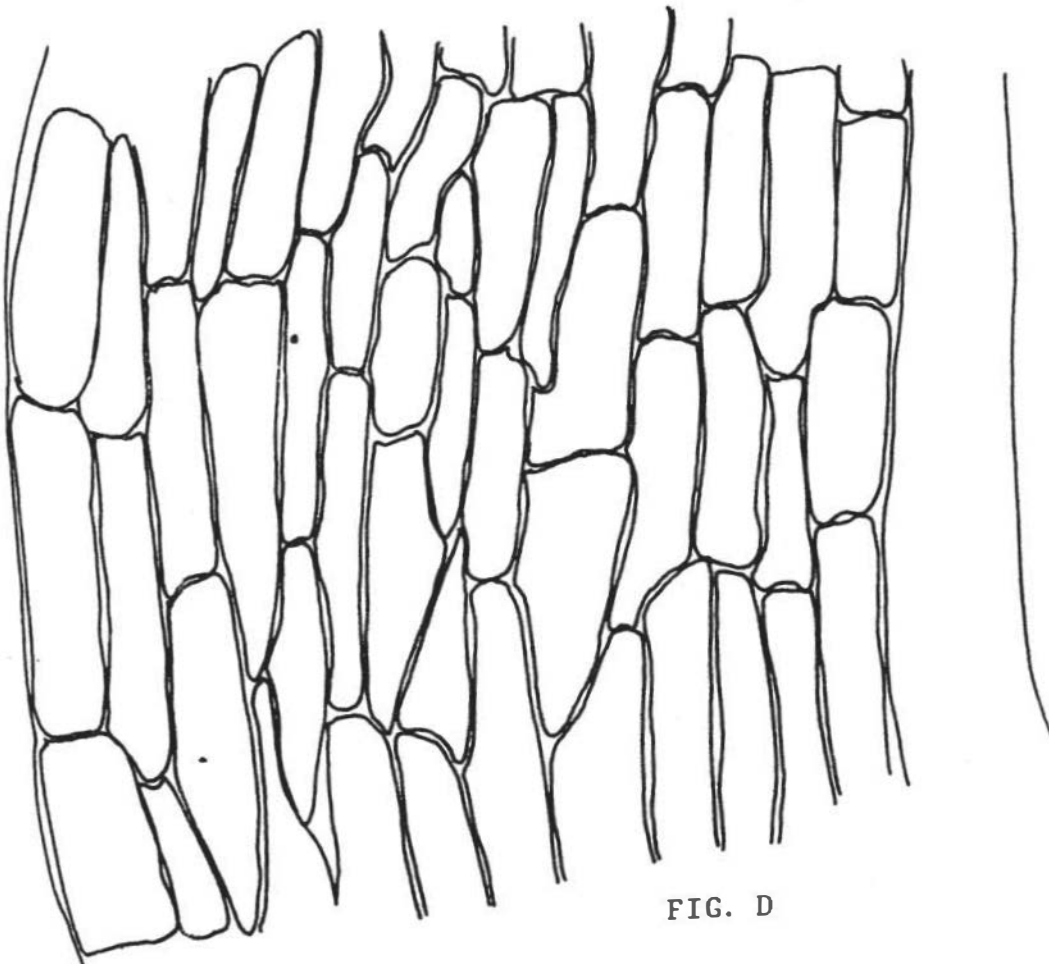


FIG. D

FAMILY: POTTIACEAE

Tortella humilis (Hedw.) Jennings

Plants in loose to dense tufts, green to yellowish green above, brown below; stems erect, from very short to 1.3 cm. high, simple; leaves crowded, crispate when dry, erect spreading when moist, the lower oblong-lanceolate, about 2 mm. long, the upper linear-lanceolate, 1.5 - 4.5 mm. long, subconcave to carinate, costa strong, yellowish, excurrent in a mucro, sometimes denticulate, glossy when dry, apices abruptly narrowed, acute or acuminate, margins entire, crenulate; median cells of leaves chlorophyllose, obscure, rounded to hexagonal, 8-9 μ long, 6-8 μ wide, papillose on both sides, cells of lower 1/3 of blade hyaline, smooth, sharply differentiated from the upper, elongated, rectangular, 25-100 μ long, 9-18 μ wide, linear near margins, extending higher up on margins than costa; monoicous; calyptra smooth, cucullate, rostrate, up to 2.7 mm. long, usually covering about 1/2 of capsule; seta yellowish green when young, reddish yellow with age, erect, 1-2 cm. long; capsule greenish yellow to yellowish or reddish brown, erect; operculum narrowly conic; rostrate, about 1/2 length of urn; the urn oblong-cylindric to ovoid-cylindric, 1.5 - 2.5 mm. long, about 0.5 mm. in diameter, symmetric, tapering at base; annulus of 3-4 rows of cells, deciduous in pieces; peristome single, teeth 32, red, filiform, papillose, 0.6-0.8 mm. long, usually twisted 2-3 times, basal membrane narrow, up to 18 μ high, spores greenish yellow, translucent, spherical, 7-11 μ in diameter, mature in spring to early summer.

Habitat: On soil, rocks, decaying wood, and bases of trees, in woods, often in calcareous regions.

Illinois distribution: Clark, Coles, Jackson, and Shelby Counties.

Tortella humilis (Hedw.) Jennings

Fig. A - Leaf - 40 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.



FIG. A

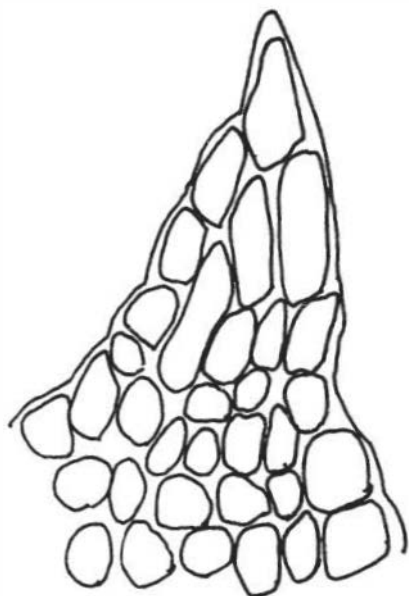


FIG. B

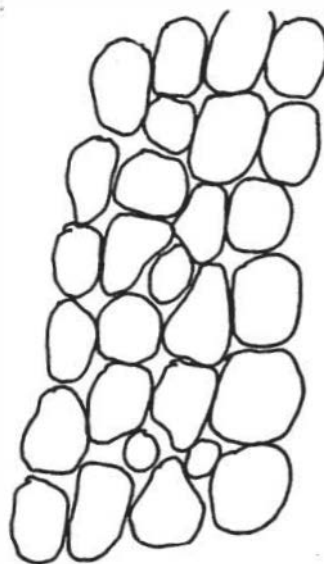


FIG. C

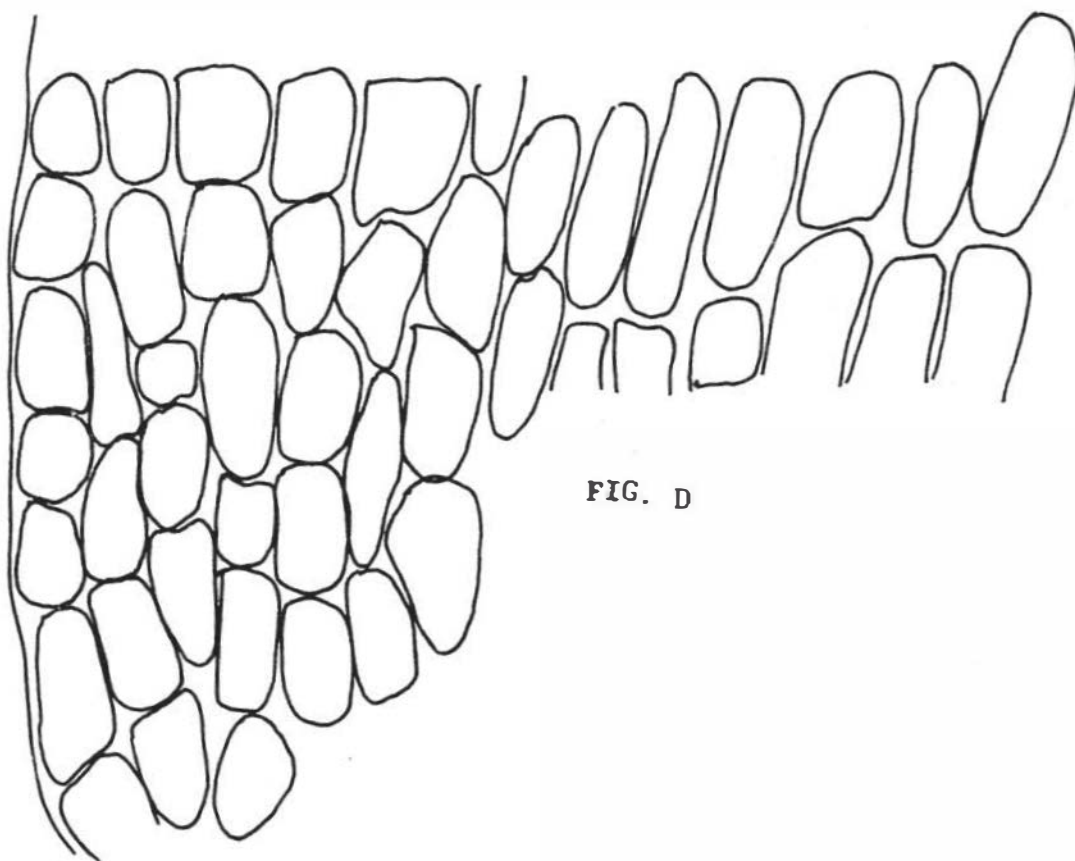


FIG. D

FAMILY: POTTIACEAE

Weisia microstoma (Hedw.) C. Muell.

Plants small, in dense sods, green; stems erect, simple or branching, up to 5 mm. in height, occasionally up to 1 cm.; leaves increasing in size from base of stem upward, upper leaves crispate when dry, erect-spreading when moist, lanceolate to linear-lanceolate, up to 3 mm. long, concave at base and tubular above, costa strong, 30-40 μ wide at base, excurrent into a sharp subhyaline point, apices acute to acuminate, margins entire, strongly involute throughout or plane near base; upper cells of leaves rounded hexagonal, 6-7 μ in diameter, densely papillose on both surfaces, the basal elongated, rectangular, mostly smooth, distinct; autogenous usually; calyptra cucullate, covering 1/2-2/3 of capsule; seta yellow, reddish with age, lustrous, erect, 3-10 mm. long; capsule erect, symmetric; operculum slenderly conic, long rostrate, 0.6-0.9 mm. in length, beak usually oblique, sometimes straight; urn light to dark brown or reddish, ovoid to oblong-cylindric, about 0.9 mm. long, smooth to plicate when dry and empty, mouth much less in diameter than remainder of urn, partially closed by a vanishing membrane due to attachment of columella to capsule wall just below line of dehiscence of operculum; annulus narrow, persistent; peristome absent; spores 18-20 μ in diameter, mature in spring.

Habitat: On bare soil, especially in old fields and on banks.

Illinois distribution: Shelby County.

Weisia microstoma (Hedw.) C. Muell.

Fig. A - Leaf - 40 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

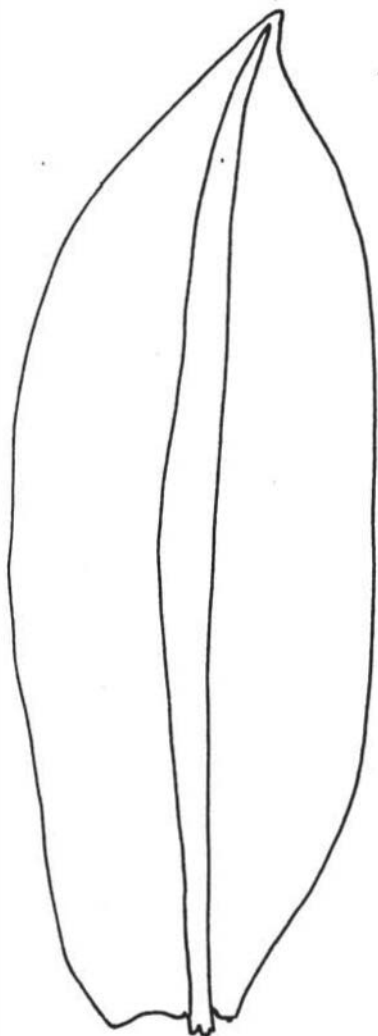


FIG. A

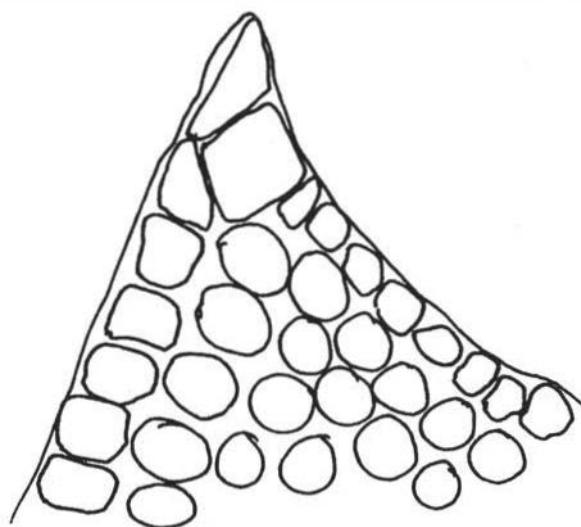


FIG. B

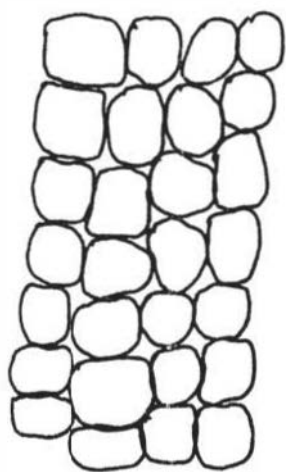


FIG. C

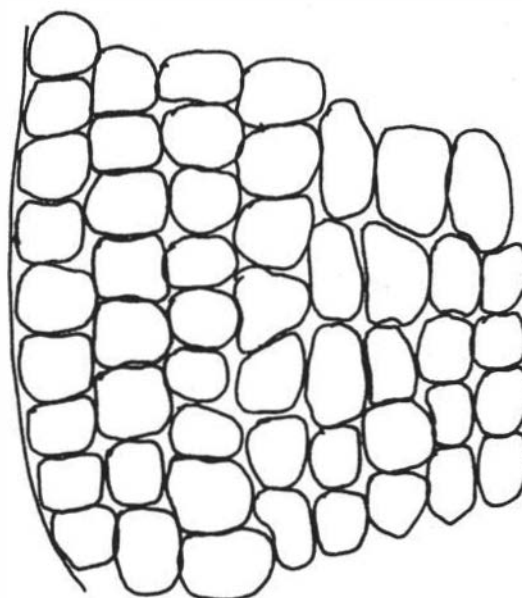


FIG. D

FAMILY: POTTIACEAE

Weisia viridula Hedw.

Plants small, in dense sods, green, stems erect, simple or branching; leaves increasing in size from base of stem upward, upper leaves crispate when dry, erect-spreading when moist, broadly lanceolate, up to 3 mm. long, concave at base and tubulose above, costa strong, 30-40 μ at base, excurrent into sharp subhyaline point, apices acute to acuminate, margins entire, strongly involute throughout; upper cells of leaves rounded hexagonal, 6-7 μ in diameter, densely papillose on both surfaces; autoicous; calyptra cucullate; seta reddish, erect, 3-10 mm. long; capsule erect, symmetric; operculum conic; urn reddish brown, plicate, not contracted beneath mouth; annulus narrow; peristome single, teeth various, 16 whenever present, red, strongly papillose; spores pellucid, orange to brown, spherical, 12-19 μ in diameter, coarsely papillose, mature in spring.

Habitat: On bare soil in various situations.

Illinois distribution: Champaign, Clark, Coles, Effingham, Fulton, Menard, Shelby, and Will Counties.

Weisia viridula Hedw.

Fig. A - Leaf - 40 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

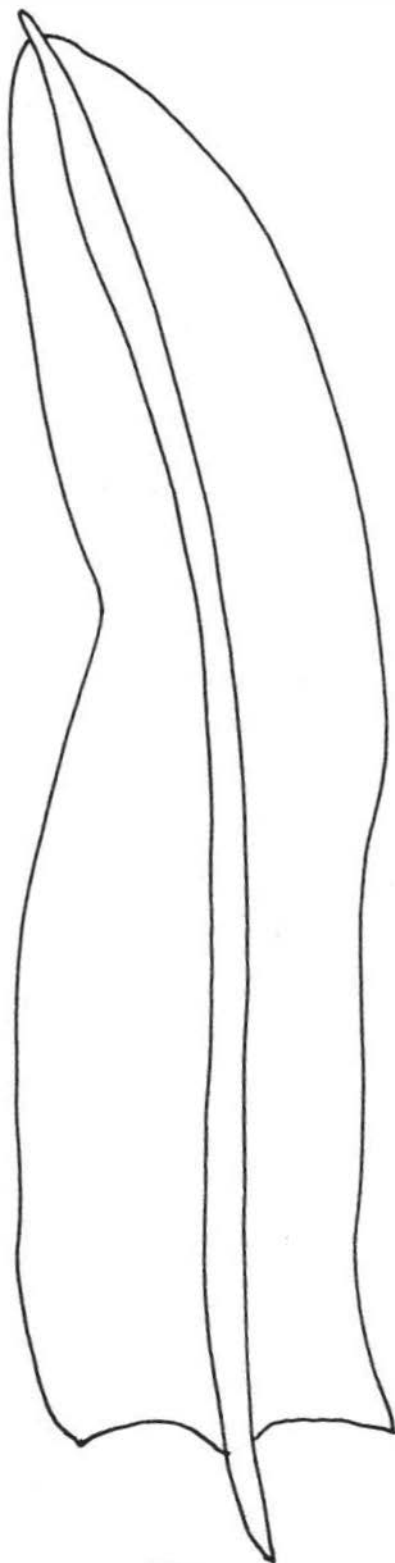


FIG. A

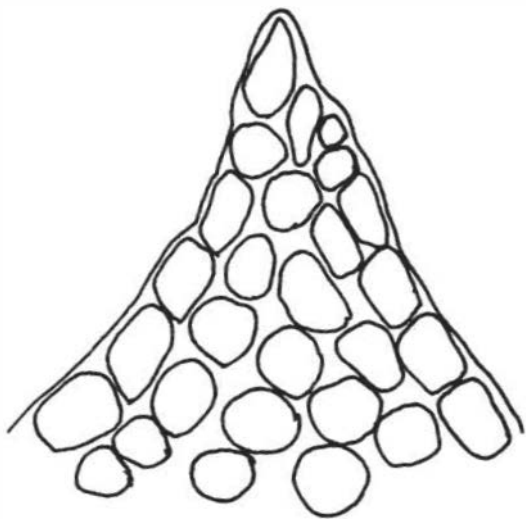


FIG. B

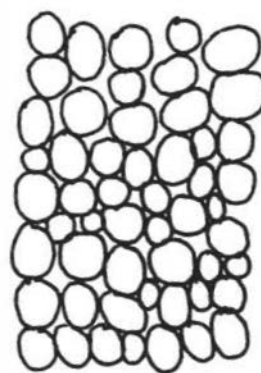


FIG. C

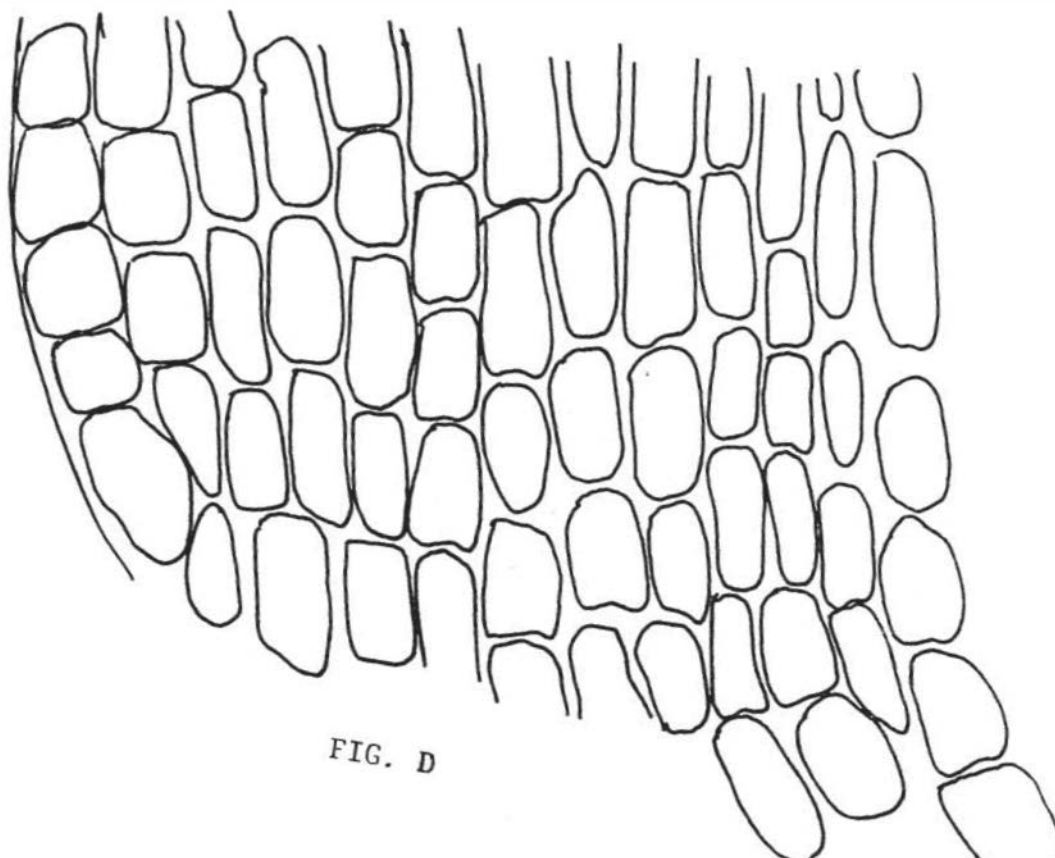


FIG. D

FAMILY: GRIMMIACEAE

Grimmia apocarpa Hedw.

Plants in loose tufts, olive green; stems ascending, branched, 1.5-2.5 cm. high; imbricate when dry, erect spreading when moist, ovate-lanceolate, 1.5-2 mm. long, subcarinate, bistratose in upper half, costa distinct, disappearing in apex, apices subobtuse, hyaline, margins narrowly recurved, entire, serrate above, cells of leaves subopaque, with incrassate walls, the upper roundish quadrate, the basal rectangular; autoicous; calyptra mitrate, lobed, 0.75 mm. long; seta erect, capsule immersed; operculum red, conic, with short beak, columella attached to the lid, urn dark reddish brown, smooth, ovoid, mouth wide when empty, peristome single, teeth reddish brown, 16, linear lanceolate, faintly papillose, revolute when mature and dry; spores reddish brown, 8-18 μ in diameter, mature in late spring to summer.

Habitat: On shaded rock, hard soil, and walls.

Illinois distribution: Carroll, Clark, Coles, Cook, Hardin, Johnson, Menard, Peoria, Pope, Rock Island, Shelby, and Union Counties.

Grimmia apocarpa Hedw.

Fig. A - Leaf - 40 X.

Fig. B - Apical cells - 160 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

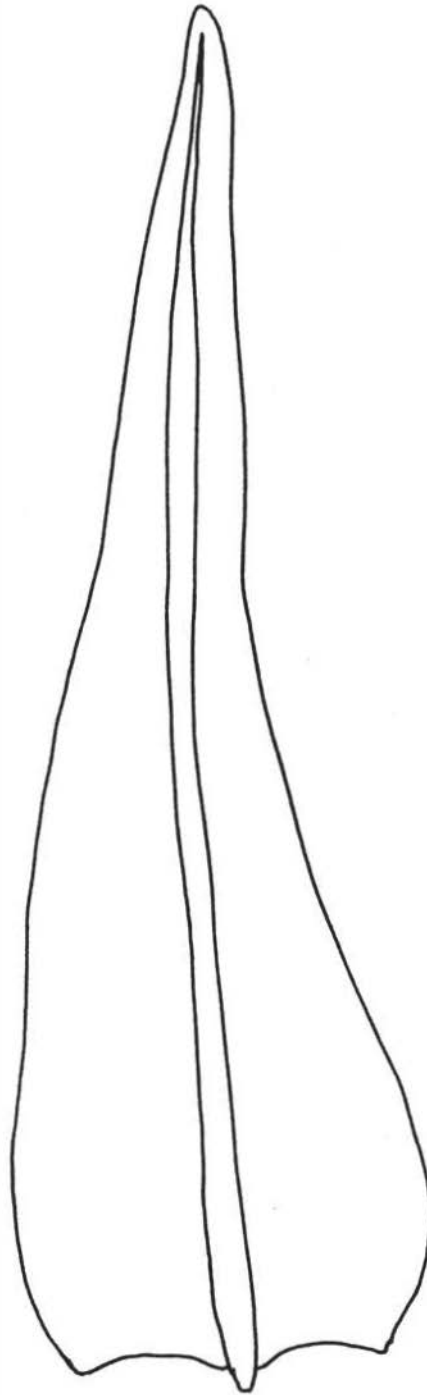


FIG. A

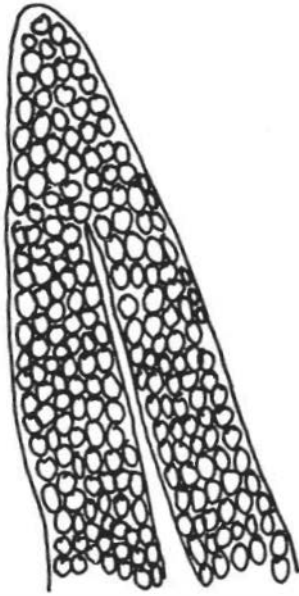


FIG. B

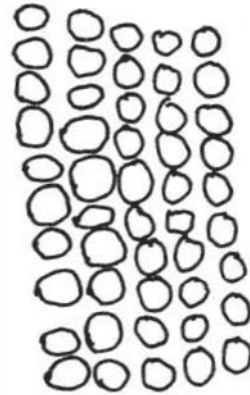


FIG. C

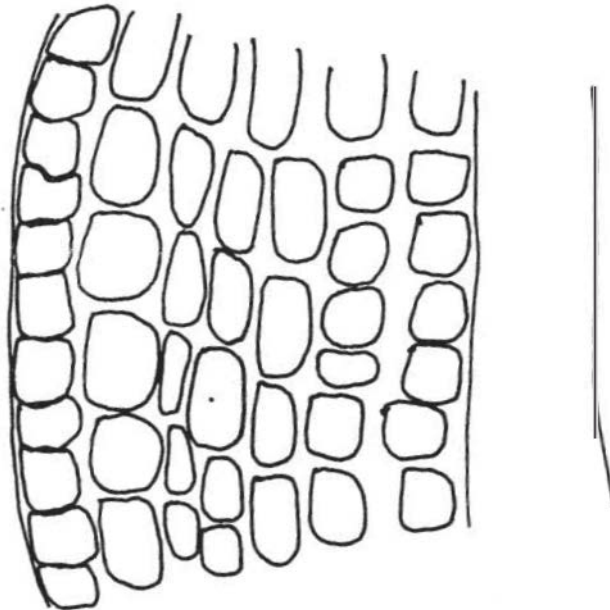


FIG. D

FAMILY: GRIMMIACEAE

Hedwigia ciliata Hedw.

Plants in loose patches, grayish green or glaucous-green, somewhat hoary because of the colorless tips of the leaves, especially so in late summer or in autumn; stems spreading, rather slender, 2-10 cm. long, with rhizoids at base, irregularly divided into rather short branches; leaves in 8 rows, imbricate when dry, with apices recurved, spreading when moist, unistratose, ovate, concave, 1.5-3 mm. long, costa none, apices subobtusely to long acuminate, subhyaline to hyaline, papillose denticulate to spinosely denticulate, margins revolute; cells of leaves with thick walls, oblong, subquadrate, quadrate, rectangular, the median and upper cells papillose, in longitudinal rows, rounded or hexagonal, lower ones elongated, those near the base quadrate, the median basal cells yellowish pellucid, not papillose, narrowly linear, walls porose, cells toward margins subquadrate to rectangular, cells in angles of leaves often brownish and larger; autoicous; perichaetial leaves larger, conspicuously ciliate toward apex; calyptra small, subcucullate, covering only the operculum, fugaceous; seta yellowish, erect, very short, capsule immersed, sessile, erect; operculum broad, convex, sometimes mammillate; urn globose, or obovoid and with wide mouth when dry and empty, 0.5-1 mm. in diameter; peristome none; spores yellowish, shallowly pitted, with vermiform striations, 25-32 μ in diameter, mature in spring.

Habitat: On dry exposed places, on siliceous walls and rocks, occasionally on trees, rarely on limestone.

Illinois distribution: Clark, Coles, Cook, Fulton, Johnson, Lake, Menard, Peoria, Pope, Saline, and Shelby Counties.

Hedwigia ciliata Hedw.

Fig. A - Leaf - 40 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

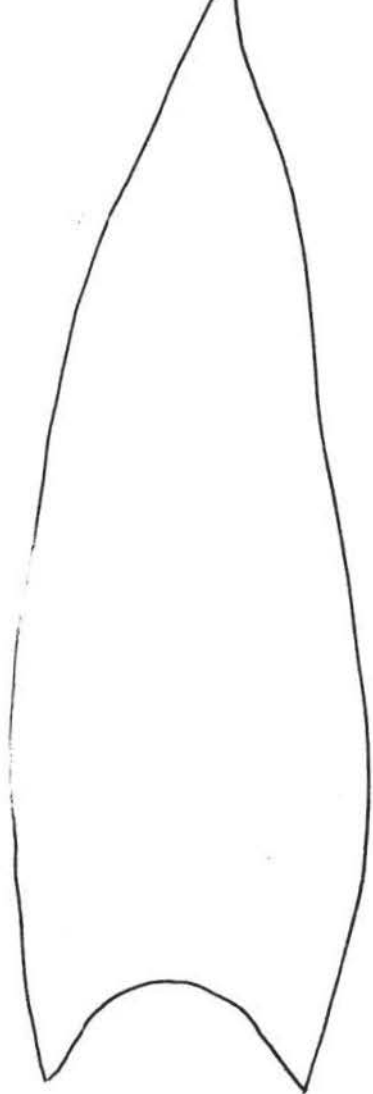


FIG. A

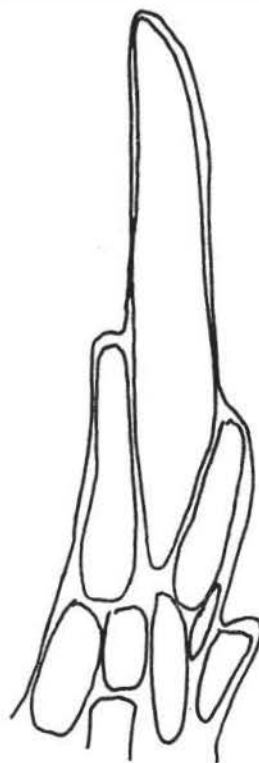


FIG. B

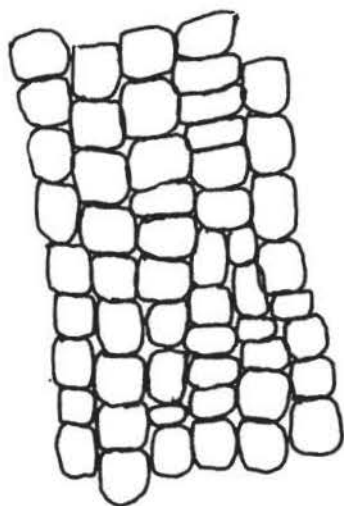


FIG. C

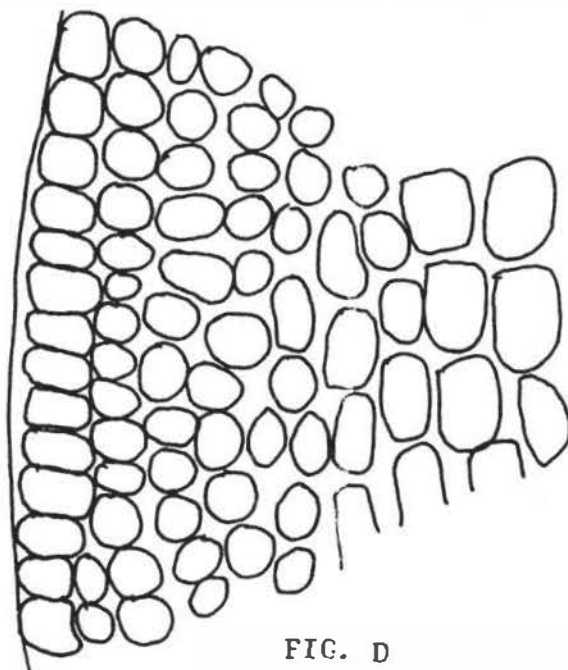


FIG. D

FAMILY: EPHEMERACEAE

Ephemerum serratum (Hedw.) Hampe

Plants minute, about 1 mm. high, bud-like, green; protonema persistent, abundant, much branched; stems absent; upper leaves slightly contorted when dry, erect, lanceolate, up to 1.5 mm. in length, larger than the lower, costa lacking, apices acuminate, margins spinose-serrate to below middle, entire below, teeth coarse, often recurved; median cells irregularly rhomboidal-hexagonal to rectangular, 15-20 μ wide; dioicous; calyptra delicate, campanulate, torn at base or on one side only, extending to middle of capsule; seta none or very short; capsule reddish brown, glossy, subglobose, briefly apiculate, cleistocarpous; spores yellowish brown, globular to kidney-shaped, 50-70 μ in diameter, warty, maturing winter to spring.

Habitat: On moist, bare soil.

Illinois distribution: Coles and Shelby Counties.

Ephemerum serrulatum (Hedw.) Hampe

Fig. A - Leaf - 40 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.



FIG. A



FIG. B

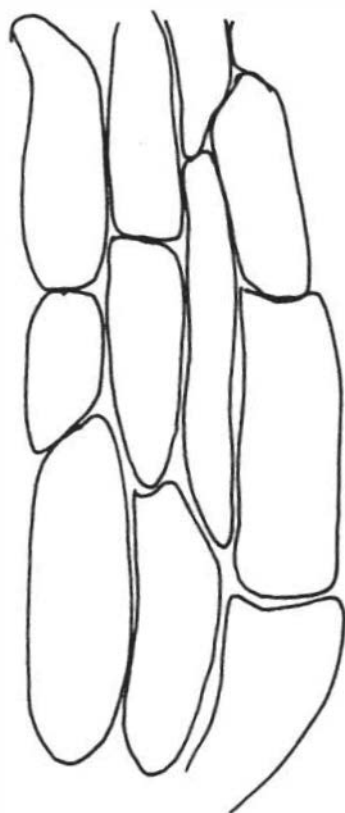


FIG. C

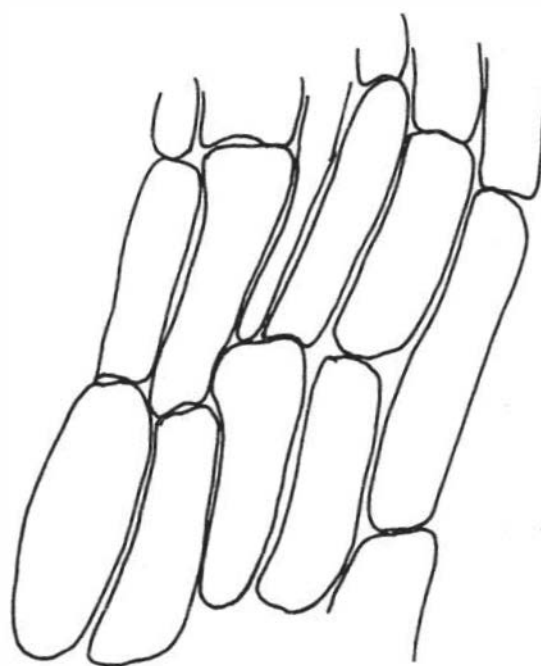


FIG. D

FAMILY: FUNARIACEAE

Aphanorhegma serratum (H.&W.) Sull.

Plants in clusters, sometimes in dense clusters, light green; stems erect, 1-5 mm. high, simple or forking; leaves contorted when dry and somewhat shriveled, erect-spreading, the upper almost erect, larger, and crowded, forming a rosette, narrowly obovate-lanceolate, oblong-lanceolate, or oblong-obovate, 3-5 mm. long, costa medium in width, ending in or just below the apex of the leaf, apices acute to acuminate, margins plane, entire below, serrulate above by projecting cells; median cells of leaves rhomboidal to short rectangular or hexagonal-rectangular, 25-30 μ wide, with walls medium in width, marginal cells narrower; paroicous; calyptra hyaline, conic-mitriform or campanulate-mitrate, 4-6 lobed at base, covering upper 1/4 of capsule; seta very short and stout, about 0.2 mm. long; capsule immersed, light brown, globose to depressed globose, apiculate-rostrate, about 0.75 mm. in diameter, smooth below, papillose in apical portion, splitting in middle along a line of 1-2 rows of small, somewhat orange, pellucid cells along the equatorial line; exothecial cells quadrate, conspicuously collenchymatous except at base; spores globose, orange, pellucid, 22-30 μ in diameter, papillose-spinose, mature in autumn.

Habitat: On damp soil, usually clay, on silty banks, and bottom land along rivers, in late autumn.

Illinois distribution: Clark, Coles, Fulton, Menard, and Shelby Counties.

Aphanorhema serratum (H.&W.) Sull.

Fig. A - Leaf - 40 X.

Fig. B - Apical cells - 160 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

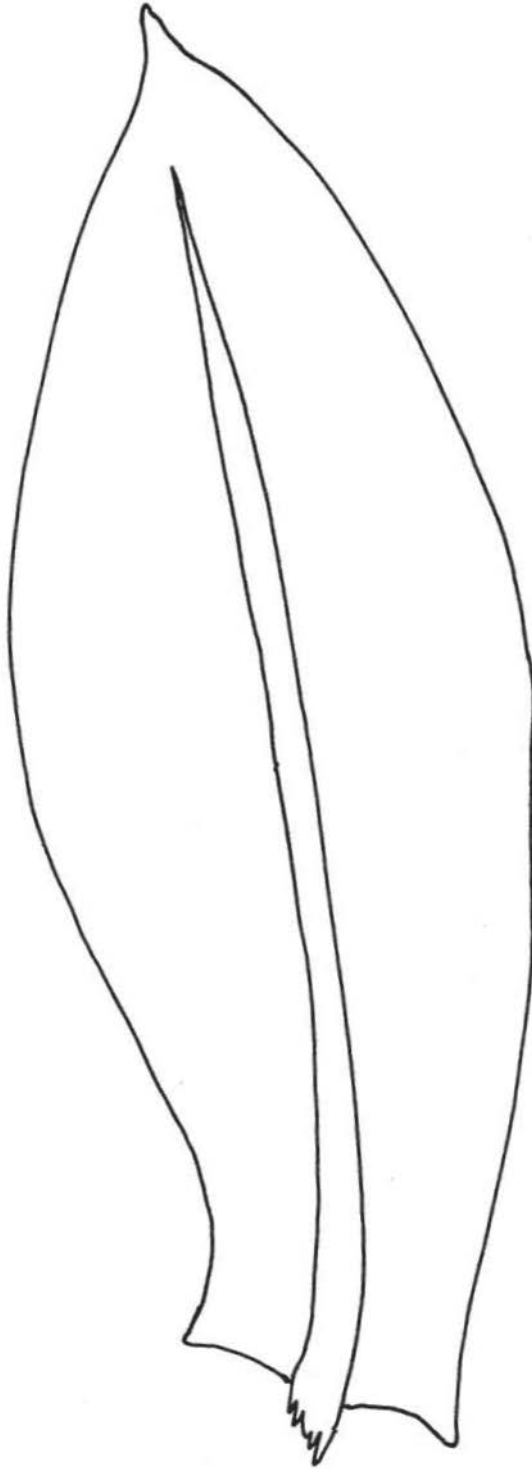


FIG. A

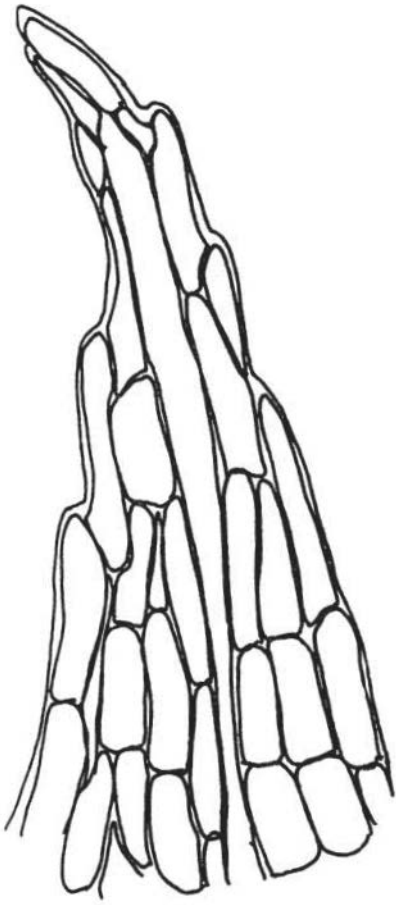


FIG. B

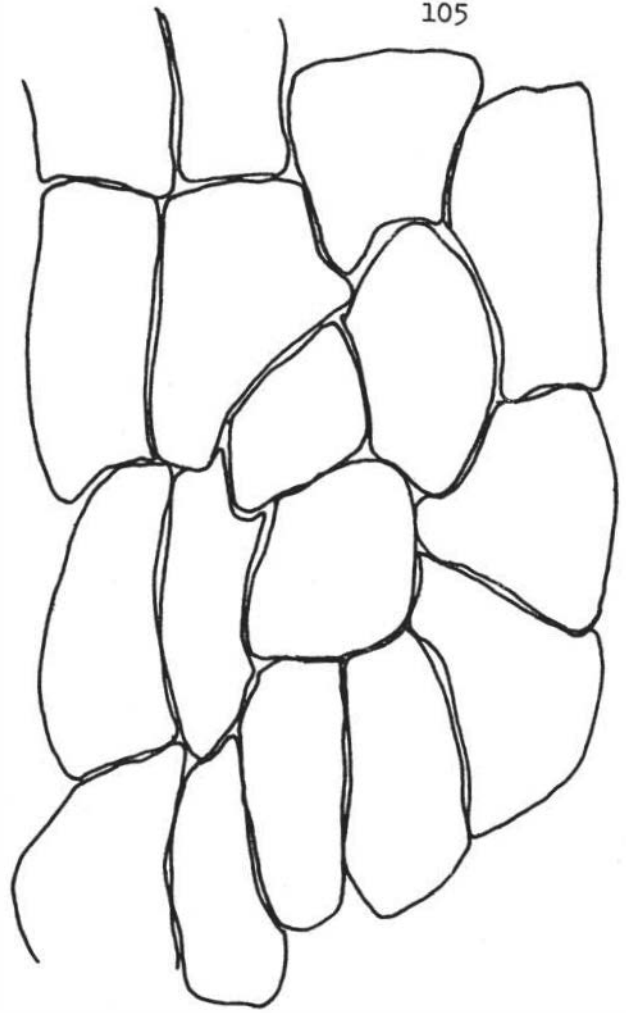


FIG. C

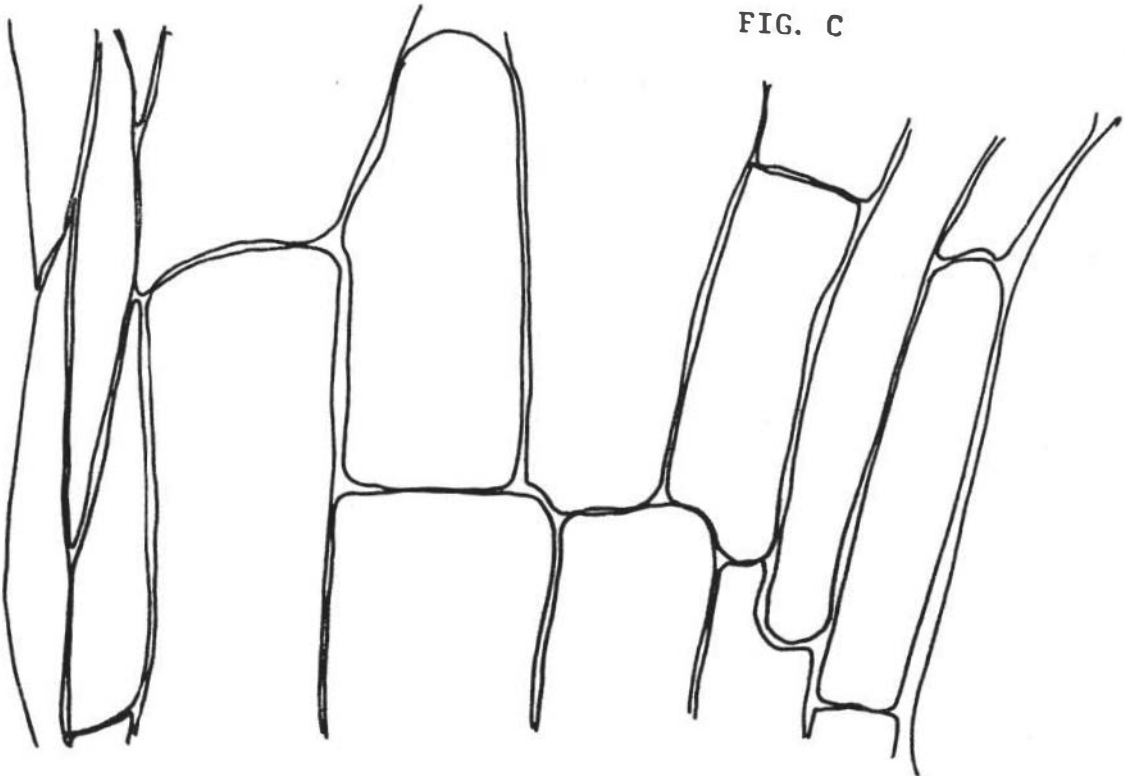


FIG. D

FAMILY: FUNARIACEAE

Funaria hydrometrica Hedw.

Plants closely or loosely clustered, in large patches, light green or pale yellowish green; stems erect, 3-10 mm. high, simple or branching at base; upper leaves erect to appressed, larger than the lower, somewhat contorted when dry, rather closely imbricated into a bulb-like tuft, with age leaves more distant and looser, broadly oval-oblong, oblong-ovate, or obovate, concave, the upper most often subtubulose, 2-4 mm. long, costa stout, ending just below the apex to very briefly excurrent, apices acute to shortly acuminate, margins entire to slightly crenate, upper cells of leaves subquadrate to subhexagonal, lower cells more elongated, marginal narrower; autoicous, calyptra inflated, cucullate, long rostrate, early deciduous; seta erect, chestnut brown, 2-5 cm. long, strongly twisted, upper part variously bent and curved when young and strongly hygroscopic when dry; capsule horizontal to pendant, greenish yellow when young, dark brown with age; operculum slightly convex, 0.7-1 mm. wide; urn subpyriform, 2-3 mm. long, very unsymmetric, strongly arcuate, turgid on upper side, deeply sulcate when dry, mouth dark red, very oblique, often parallel with the lower side of urn, 0.6-0.8 mm. wide; annulus of 2-3 rows of large cells, deciduous; peristome double, teeth dark red to castaneous, 16, spirally twisted, strongly papillose, with faint vertical striae below, subcylindric above with ciliate-fimbriate appendiculae, united by tips into a small lace-like central disk, segments of inner peristome somewhat

shorter than the teeth, usually about $3/4$ as long, lanceolate, with slender apices, papillose; spores small, 12-17 μ in diameter, smooth, mature May or June.

Habitat: In waste places and on bare soil, especially where fires have burned, frequently on calcareous substrata.

Illinois distribution: Champaign, Clark, Coles, Cook, Effingham, Fulton, Henderson, Johnson, Kankakee, LaSalle, McDonough, Menard, Peoria, Saline, Shelby, Stark, and Will Counties.

Funaria hydrometrica Hedw.

Fig. A - Leaf - 40 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.



FIG. A



FIG. B

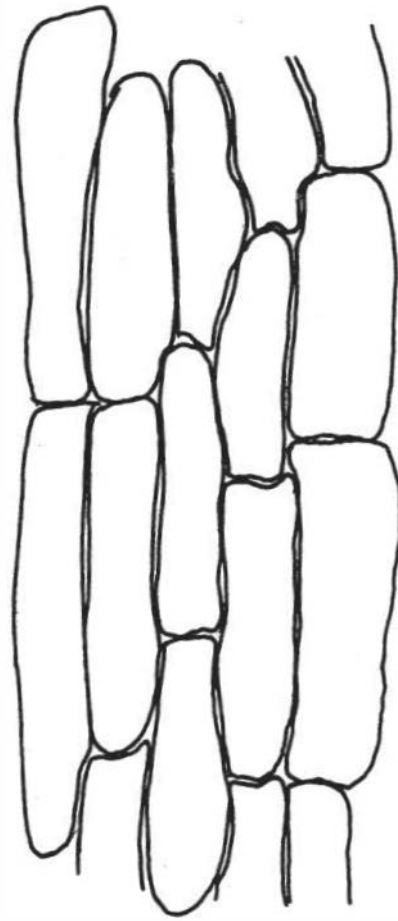


FIG. C

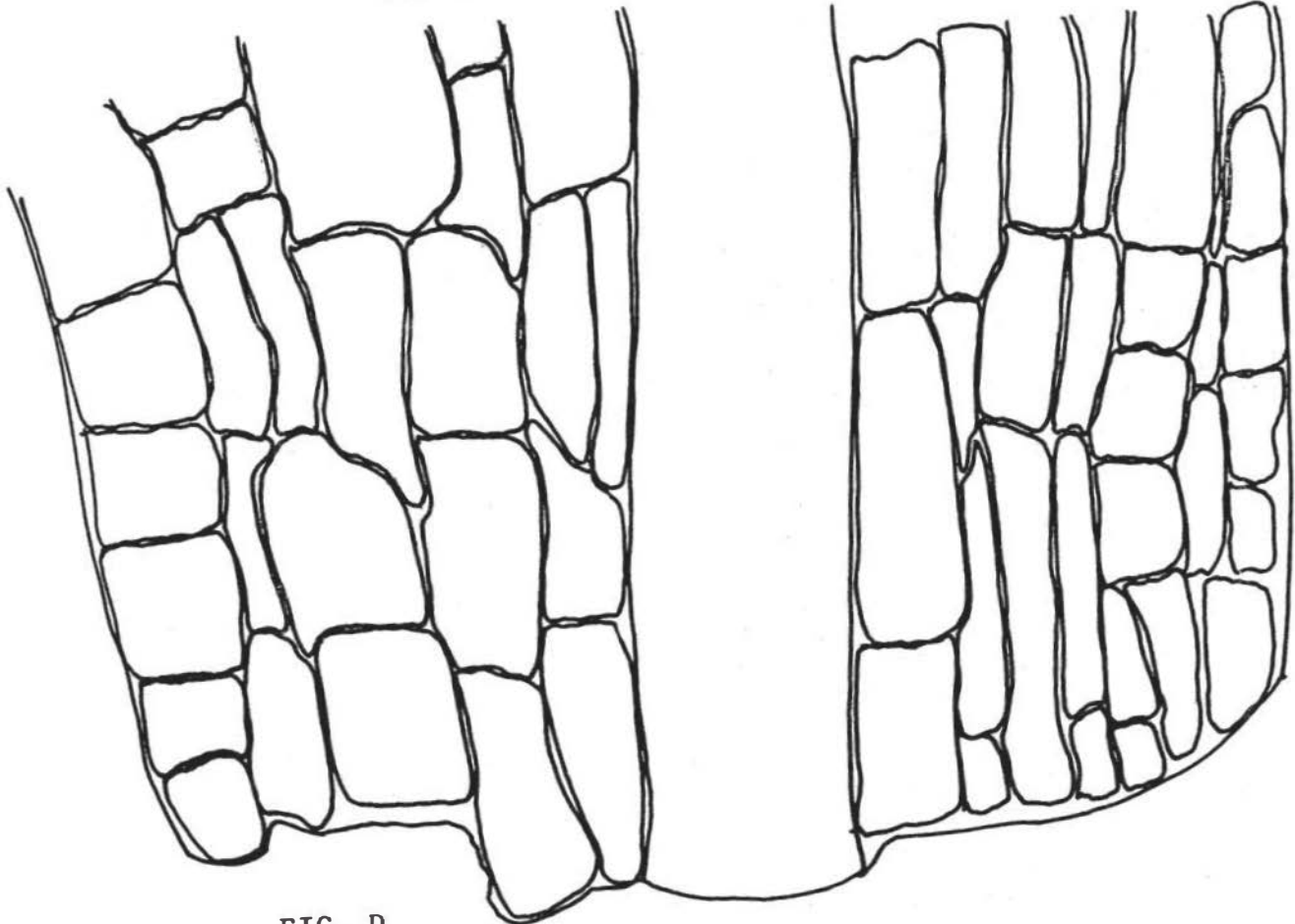


FIG. D

FAMILY: FUNARIACEAE

Physcomitrium turbinatum (Mx.) Brid.

Plants in clusters, light green stems erect, usually short and simple, 3-12 mm. high; leaves moderately distant, contorted when dry, plant spreading when moist, oblong-lanceolate or obovate-lanceolate, 3-5 mm. long, costa ending in or below the leaf apex, apices acuminate, margins entire below, serrate above the middle; median cells of leaves rhomboidal to oblong-hexagonal, marginal cells longer and narrower; autoicous; calyptra cucullate, suboblique, rostrate, unequally split at base into 3-5 lobes; seta usually erect, 5-15 mm. long; capsule erect, becoming brown with age; operculum convex, mammillate, apiculate, or subrostrate; urn symmetric, globose-pyriform when young, turbinate when dry and empty, contracted below mouth and below spore sac, often urn-shaped with age, 1-2 mm. long, mouth bordered by 8-12 rows of transversely elongated cells, 20-25 μ wide, and a narrow layer of 1-3 rows of smaller, orange-pellucid cells; annulus of large, incurved cells, separating in fragments; peristome none; spores orange-pellucid, large, 16-40 μ in diameter, strongly papillose, mature in spring, usually May and June, occasionally later.

Habitat: On bare soil, in fields, lawns, gardens, along roadsides, in moist places by paths in parks and in open woods.

Illinois distribution: Champaign, Clark, Coles, Cook, Henderson, McDonough, Macon, Peoria, Shelby, Stark, Will, and Williamson Counties.

Physcomitrium turbinatum (Mx.) Brid.

Fig. A - Leaf - 26.5 X.

Fig. B - Apical cells - 104 X.

Fig. C - Median cells - 104 X.

Fig. D - Alar cells - 104 X.

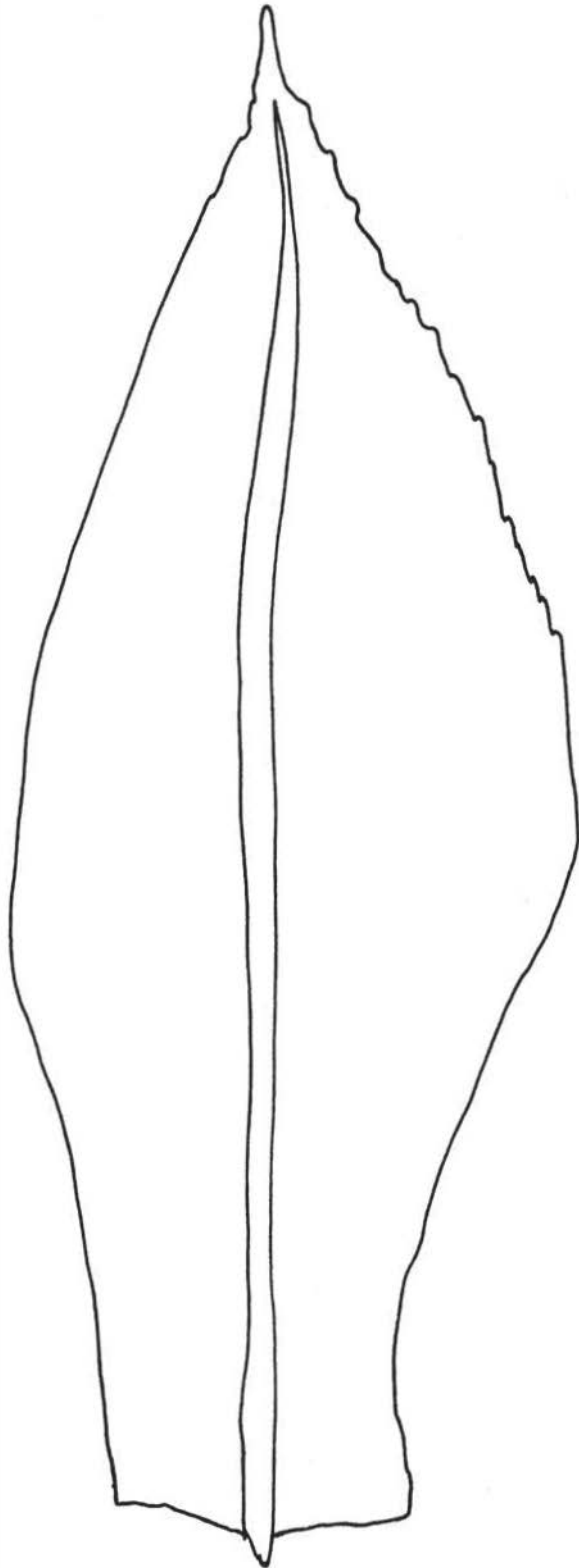


FIG. A

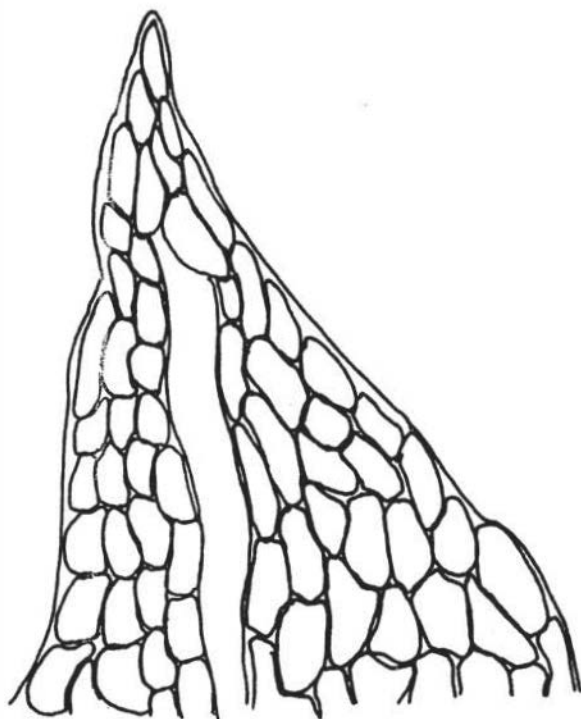


FIG. B

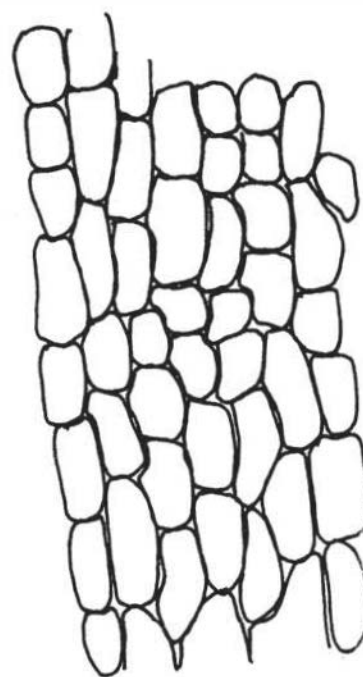


FIG. C

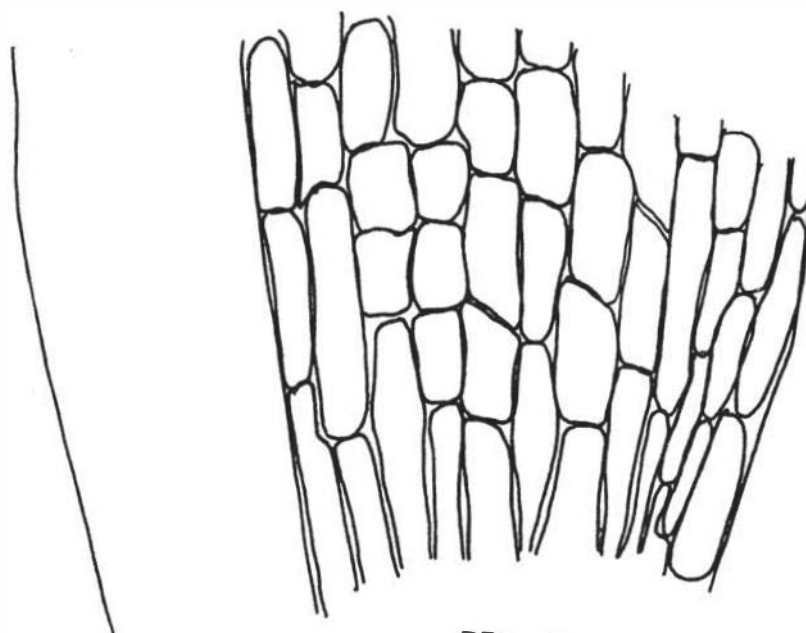


FIG. D

FAMILY: ORTHOTRICHACEAE

Orthotrichum ohioense Sull. & Lesq.

Plants in moderately small, dense cushions or tufts, yellowish green above; brownish below; stems erect, 5-10 mm. high, branching above; leaves appressed-imbricate when dry, ascending to spreading when wet, oblong-lanceolate, 1.5-3 mm. long, concave, costa strong, ending slightly below the apex of the blade, apices rounded obtuse, narrowly obtuse, or obtusely acute, margins revolute, entire; upper cells of leaves irregularly rounded, nearly isodiametric, 10-12 μ in diameter with thick walls, densely papillose, median cells quadrate to rectangular, moderately incrassate, cells becoming longer toward the base, smooth at base; autoicous; calyptra conic, campanulate, plicate, with erect hairs; seta shorter than urn; capsule subimmersed to immersed, symmetric, 1-1.3 mm. long; operculum convex, apiculate to rostrate; urn oblong-ovoid when moist, straw-colored and somewhat 8-ribbed when dry and slightly or not at all contracted beneath mouth, tapering at base, neck short to almost lacking, stomata immersed, slightly below middle of urn; annulus narrow; peristome double, teeth yellowish pellucid, reflexed when dry, 16, frequently united in pairs, triangular-lanceolate, densely and finely papillose, segments of inner peristome 8, linear, shorter than teeth, of 1-2 vertical rows of cells; spores spherical, slightly papillose, 10-17 μ in diameter, maturing in late spring.

Habitat: On bark of trees in the open, especially on shade trees; apple, and butternut.

Illinois distribution: Coles, Fulton, and Shelby Counties.

Orthotrichum ohioense Ren. & Car.

Fig. A - Leaf - 40 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 160 X.

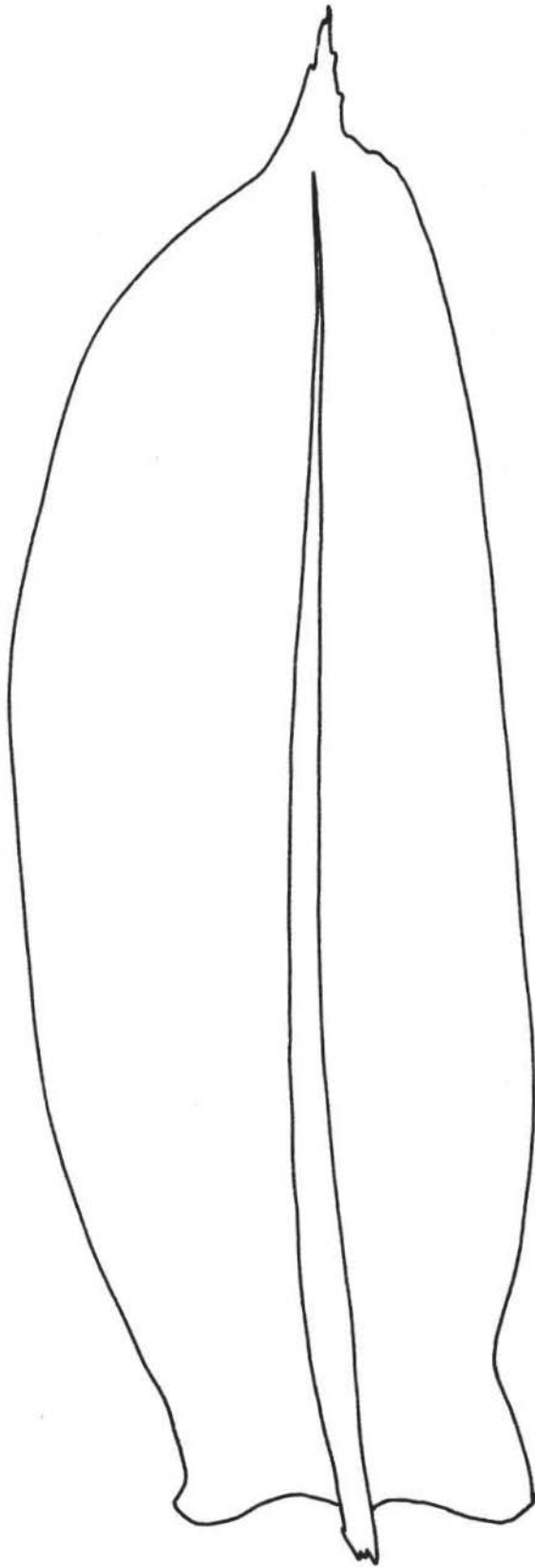


FIG. A

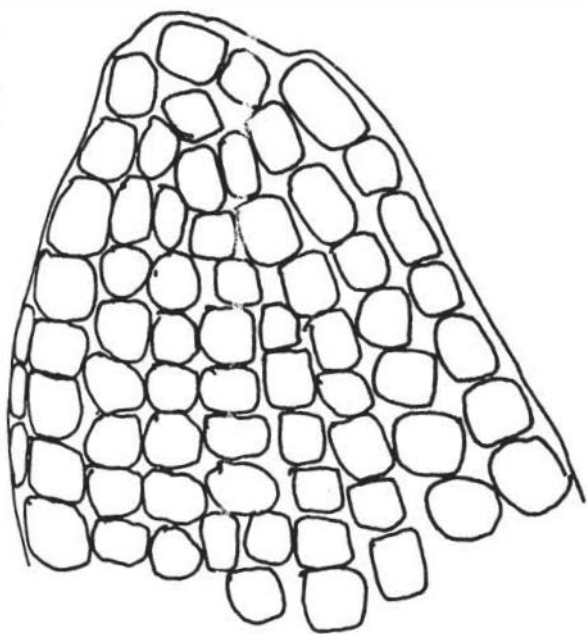


FIG. B

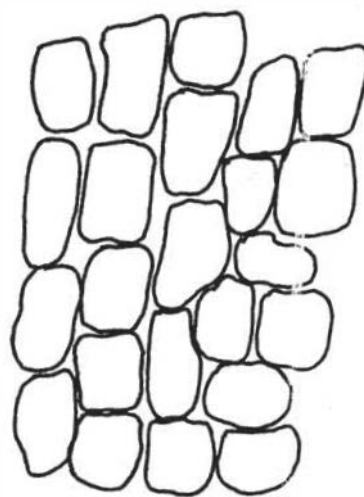


FIG. C

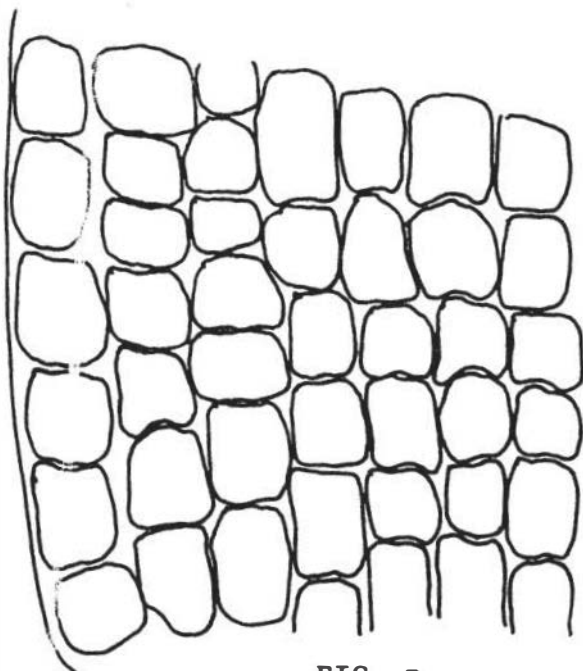


FIG. D

FAMILY: ORTHOTRICHACEAE

Orthotrichum pumilum Dicks

Plants in close tufts, dark green; stems erect, up to 1 cm. long; leaves imbricate and not contorted when dry, erect spreading when dry, moist, broadly to narrowly oblong-lanceolate, about 2 mm. long, concave, costa strong, ending below apex, apices briefly acuminate to narrowly obtuse, often with a single subhyaline cell at apex, margins revolute nearly to apex, entire; upper cells of leaves irregularly rounded hexagonal, 12-16 μ in diameter, walls rather thin, slightly collenchymatous, papillose with low papillae, basal cells smooth; autoicous; calyptra strongly plicate, seta very short, about 0.5 mm. long; capsule immersed to slightly emergent; operculum conic, apiculate; urn usually light colored, oblong to oblong-ovoid when moist, up to 1.5 mm. long, 8-ribbed and contracted below mouth when dry, abruptly marrowed to neck, neck distinct, stomata immersed; annulus present; peristome double, teeth 16, triangular-lanceolate, usually united in pairs, reflexed when dry, finely papillose, segments of inner peristome 8, linear, slightly shorter than teeth, of 2 vertical rows of cells at base; spores 12-15 μ in diameter, maturing in spring.

Habitat: On bark of trees.

Illinois distribution: Clark, Coles, and Shelby Counties.

Orthotrichum pumilum Dicks

Fig. A - Leaf - 40 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 160 X.

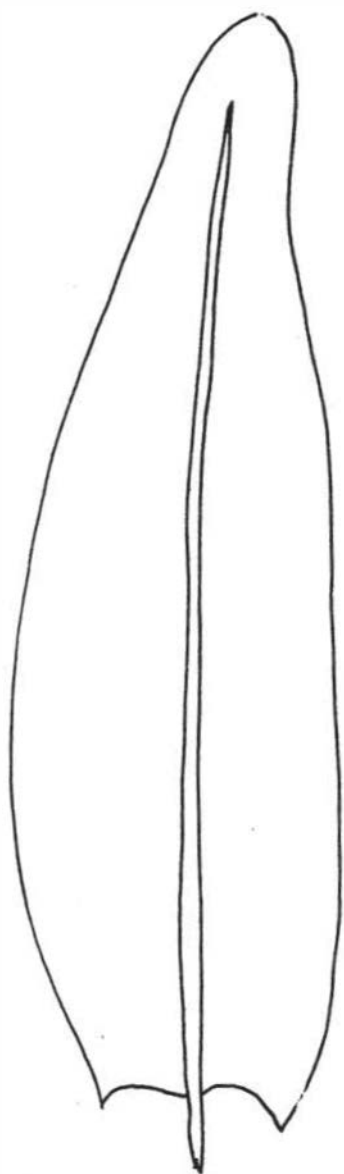


FIG. A

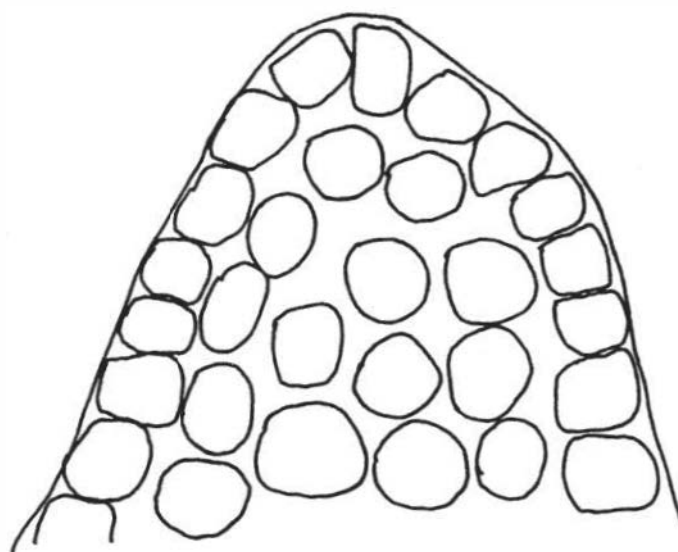


FIG. B

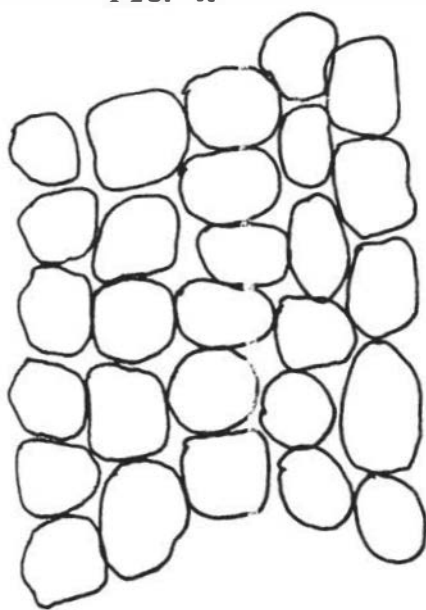


FIG. C

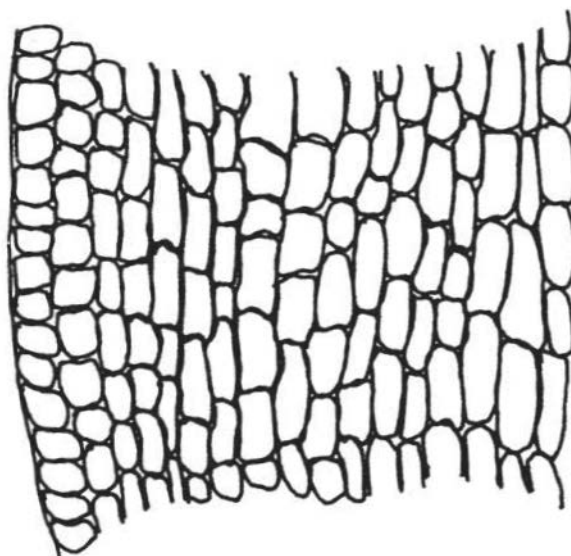


FIG. D

FAMILY: ORTHOTRICHACEAE

Orthotrichum pusillum Mitt.

Plants in small, loose, patches; blackish green; stems erect, very short, up to 5 mm. high; leaves larger above the upper broadly oblong-lanceolate, 1.5-2.5 mm. long, carinate, costa strong, ending below apex, apices broadly obtuse, some with several projecting cells at the denticulate tip, margins strongly revolute, entire below, denticulate above upper cells irregularly rounded, about 15 μ in diameter, incrassate, papillose; autoicous; calyptra plicate, naked, seta very short, capsule almost sessile, immersed or whitish, smooth, stomata about the middle of the urn, immersed; annulus present; peristome double, teeth 16, usually 8, slender, spores about 15 μ in diameter, maturing in early spring.

Habitat: Bark of trees.

Illinois distribution: Shelby and Union Counties.

Orthotrichum pusillum Mitt.

Fig. A - Leaf - 40 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

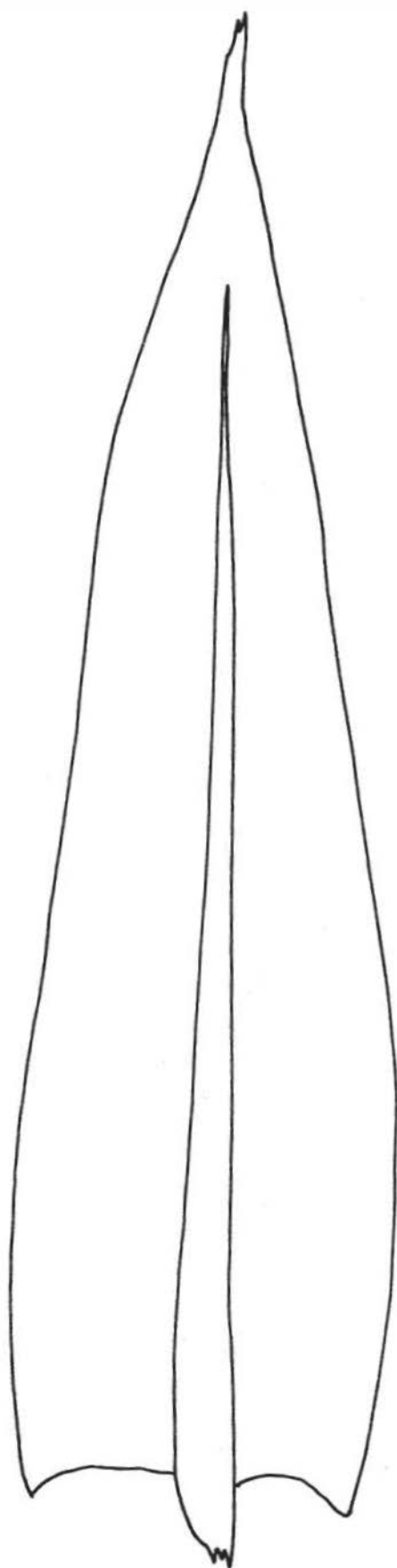


FIG. A

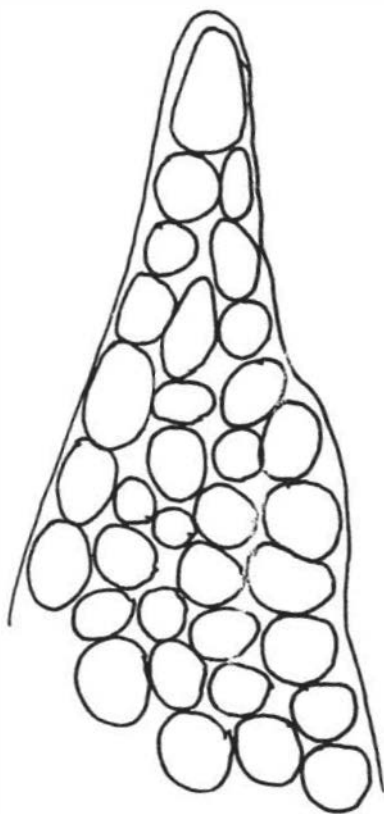


FIG. B

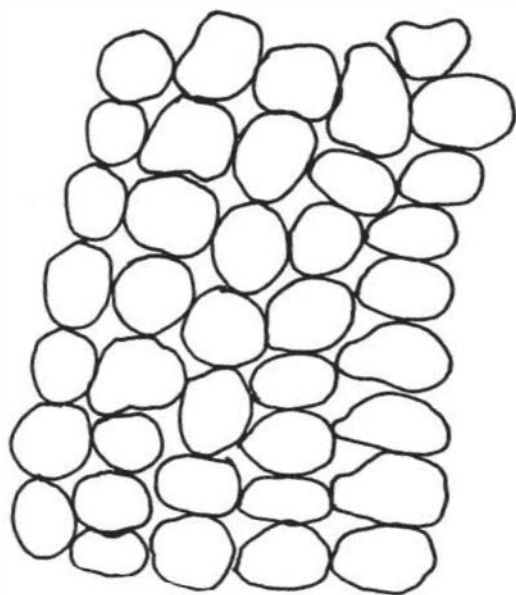


FIG. C

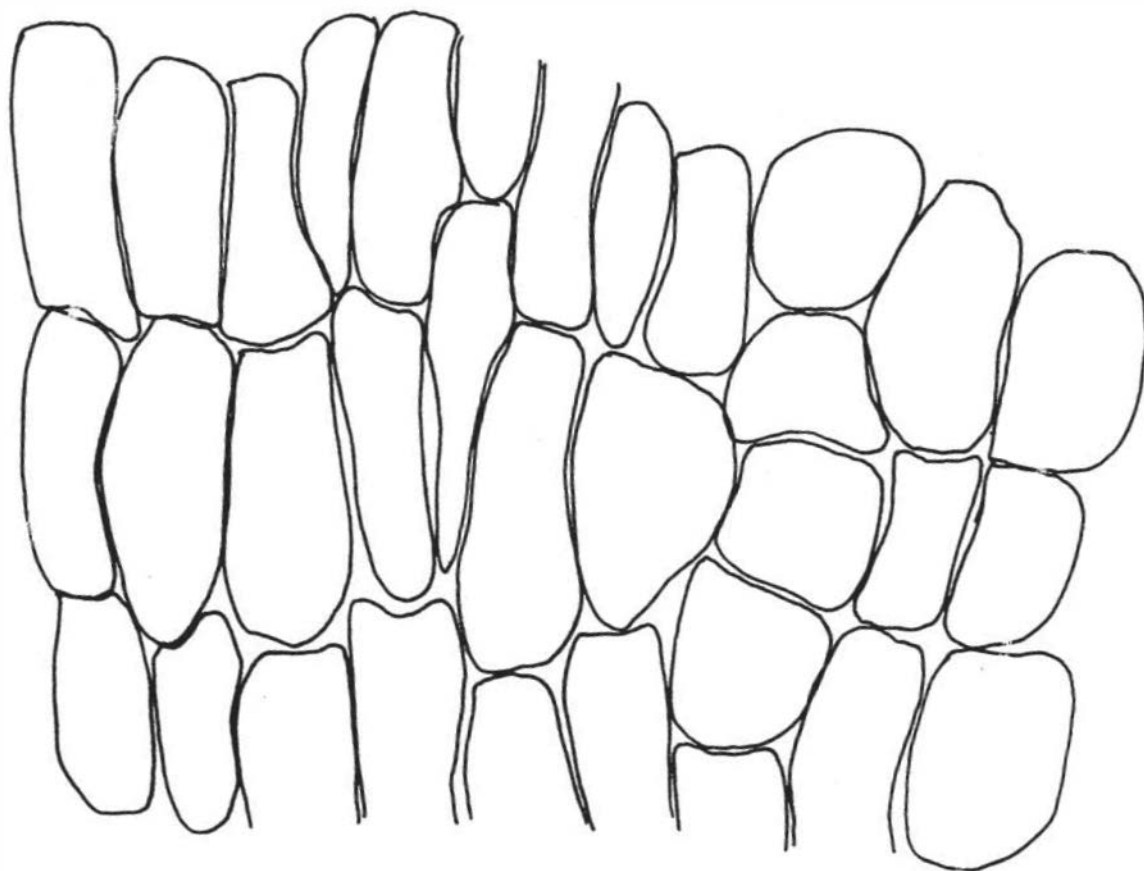


FIG. D

FAMILY: ORTHOTRICHACEAE

Ulot crispa (Hedw.) Brid.

Plants in dense tufts or round cushions, yellowish green above, brownish below; stems usually erect, 5-10 mm. long, sparingly branched; leaves of stems strongly crisped when dry, straight and erect-spreading when moist, narrowly ovate-lanceolate, 2-3 mm. long, concave at base, subcarinate to carinate above, costa strong, subpercurrent, apices narrowly obtuse, acute or acuminate, margins plane or revolute; upper cells of leaves subcircular to transversely elliptical, lumen 8-10 μ in diameter, cell walls very thick, about 3 μ wide, slightly papillose, median cells rounded, incrassate, bluntly papillose; usually autoicous, rarely dioicous; calyptra mitrate or conic-campanulate, incised-lobe at base, with 10-16 obtuse folds, hirsute with glossy golden yellow hairs, rarely subglabrous; seta erect, 1-2 mm. long; capsule well exserted; operculum conic; rostrate; urn obovoid, with a long, slender neck, about 1 mm. in length, length of urn with neck and operculum about 2 mm., when dry the urn slightly contracted below the mouth and suburnolate, abruptly contracted to the shrunken and wrinkled neck, 8-ribbed, with age urn narrowly subcylindric and deeply plicate, stomata superficial, on neck, just below spore sac; annulus brownish pellucid, of about 3 rows of small cells, persistent peristome double; teeth reflexed when dry, 16, triangular-lanceolate, about 0.2 mm. long, finely papillose, often perforate near apex, segments of inner peristome 8, shorter than teeth, consisting of

2 vertical rows of cells; spores spherical, 22-26 μ in diameter, finely papillose, maturing in late spring to early summer.

Habitat: On bark of trees, especially the deciduous, in moist woods.

Illinois distribution: Shelby County.

Ulota crispa (Hedw.) Lindb.

Fig. A - Leaf - 40 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

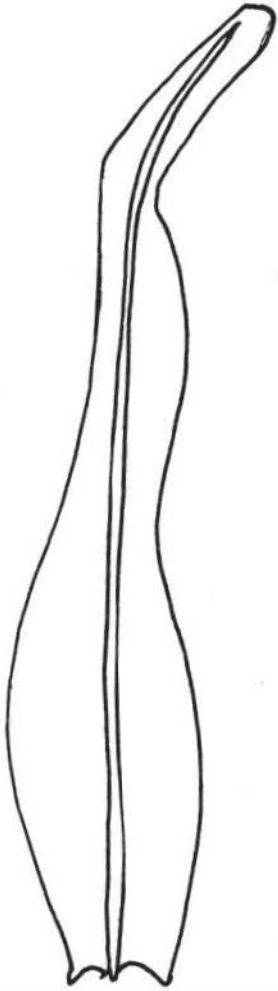


FIG. A

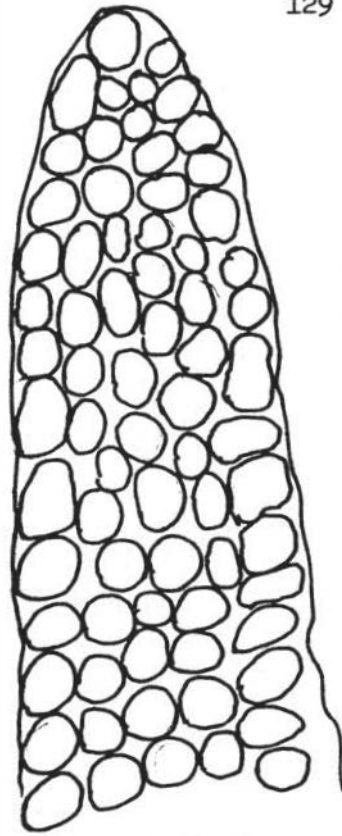


FIG. B

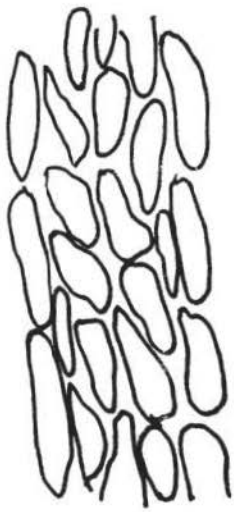


FIG. C

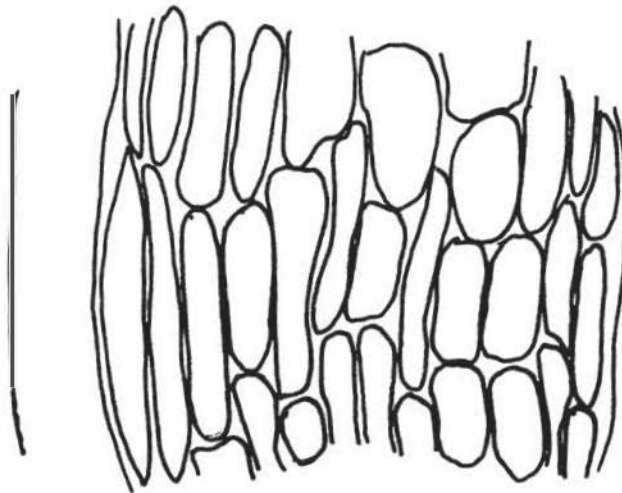


FIG. D

FAMILY: AULACOMNIACEAE

Aulocomnium heterostrichum Schwaegr.

Plants loosely tufted, 4-5 cm. high, green above, primary stems about 1 cm. long; leaves dense, erect, inclined to one side, not curled when dry, elongate-ovate, 2-3 mm. long, 1-1.5 mm. wide, bases decurrent, costa stout at base, narrowing above, ending below apex, apices obtuse, margins plane or slightly recurved, coarsely toothed in upper 1/2-2/3; median cells of leaves rounded-quadrate or ellipsoidal, 8-16 μ in diameter, papillae single; autoicous; calyptra cucullate, long rostrate; annulus present; teeth of peristome pale yellow, almost smooth in lower 2/3, hyaline; spores slightly papillose, 9-12 μ in diameter, mature in late summer.

Habitat: On shaded, moist, rich soil, in woods, especially at bases of trees.

Illinois distribution: Champaign, Clark, Coles, Effingham, Fulton, Hancock, Jackson, Johnson, Lake, LaSalle, Marion, Menard, Ogle, Peoria, Saline, and Shelby Counties.

Aulocomnium heterostichum (Hedw.) B.S.G.

Fig. A - Leaf - 26.5 X.

Fig. B - Apical cells - 260 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

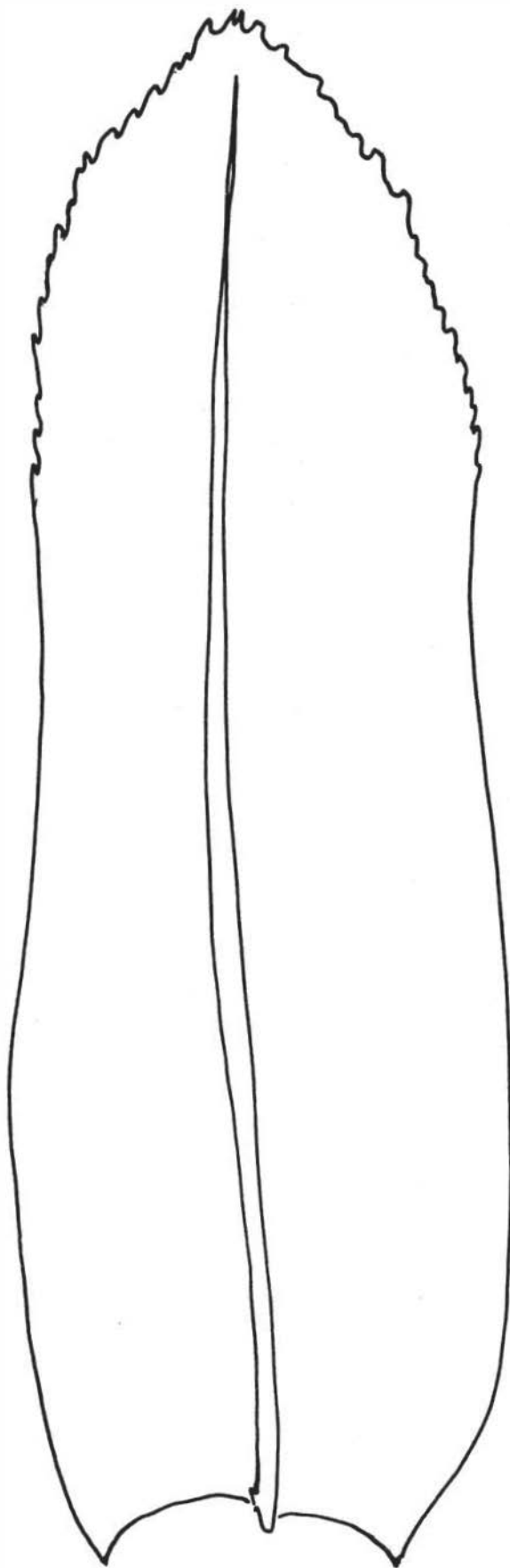


FIG. A

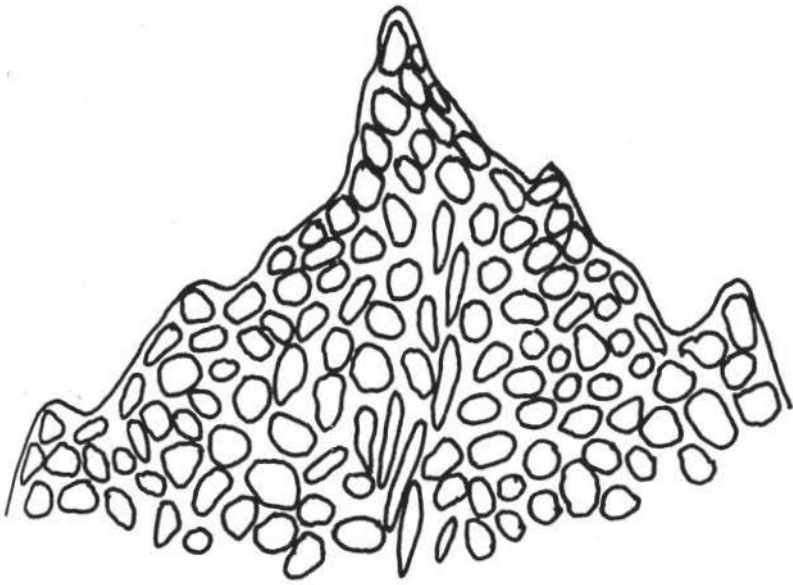


FIG. B



FIG. C

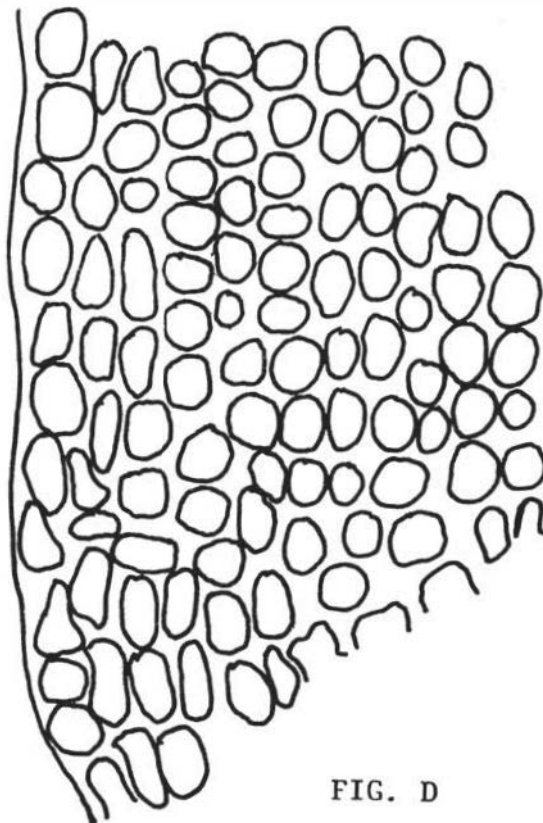


FIG. D

FAMILY: BARTRAMIACEAE

Bartramia pomiformis Hedw.

Plants in tufts, very soft, green or yellowish green, densely tomentose below with brown papillose rhizoids; stems erect, branched, when moist, narrowly lanceolate to linear-lanceolate, canaliculate, 4-7 mm. long, base ovate or oblong, plane to slightly clasping, costa stout, prominent on lower surface of leaf, strongly spinulose above, excurrent to a very spinulose, terete point, margins revolute, bistratose above and doubly serrate, serrate on both margin and recurved surface; median cells rounded quadrate, incrassate, upper cells of leaves oblong, elliptical, or subquadrate, approximately 7 μ wide, papillose on upper and lower surfaces, basal cells oblong to linear, papillose on both ends; autoicous; perigonia borne below and very close to perichaetium, both lateral by innovation; calyptra narrowly cucullate, about 2 mm. long, fugacious; seta reddish brown, erect, up to 2 cm. in length; capsule usually exserted above the stem tips, inclined or cernuous, unsymmetric, reddish to dark chestnut brown; operculum short, convex; urn globose to ovoid, deeply furrowed when dry, approximately 1.5 mm. long and 1.5 mm. in diameter; annulus none; peristome double, teeth reddish to reddish brown, lanceolate, slightly papillose, about 0.4 mm. long, segments pale yellowish, keeled, from a high basal membrane, 2/3 length of teeth, cilia poorly developed, 2-3, rudimentary or none; spores reddish brown, spherical to reniform, coarsely papillose, 20-26 μ in diameter, mature in May or June.

Habitat: On moist, shaded soil and in moist crevices of rocks; in woods, shaded ravines, canyons, on cliffs, and on swampy ground.

Illinois distribution: Champaign, Clark, Coles, Cook, Fulton, Henderson, Johnson, Lake, LaSalle, Menard, Peoria, Pope, Rock Island, Saline, and Shelby Counties.

Bartramia pomiformis Hedw.

Fig. A - Leaf - 26.5 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

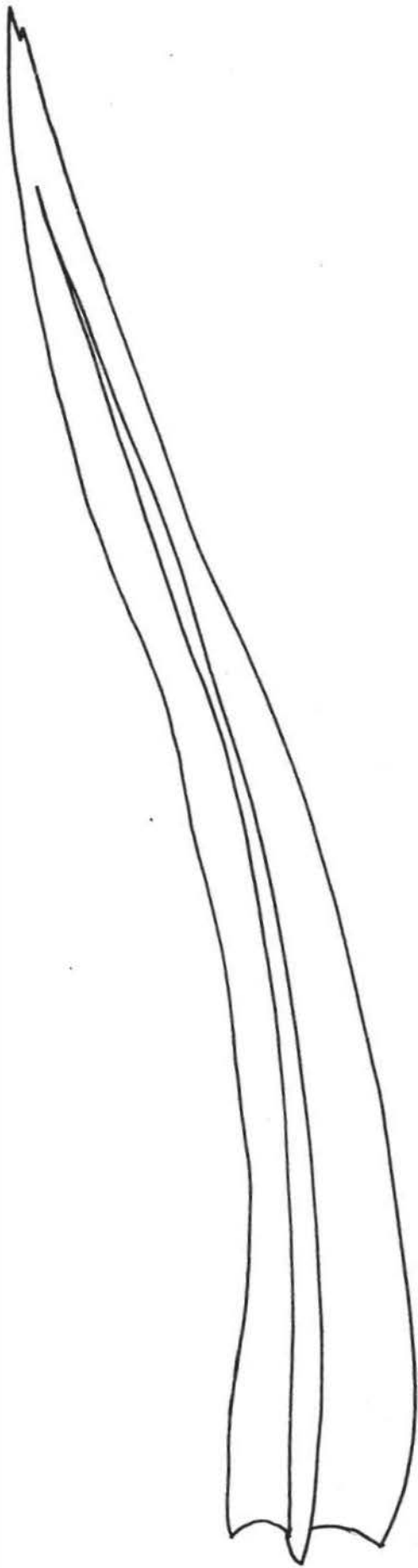


FIG. A



FIG. B



FIG. C

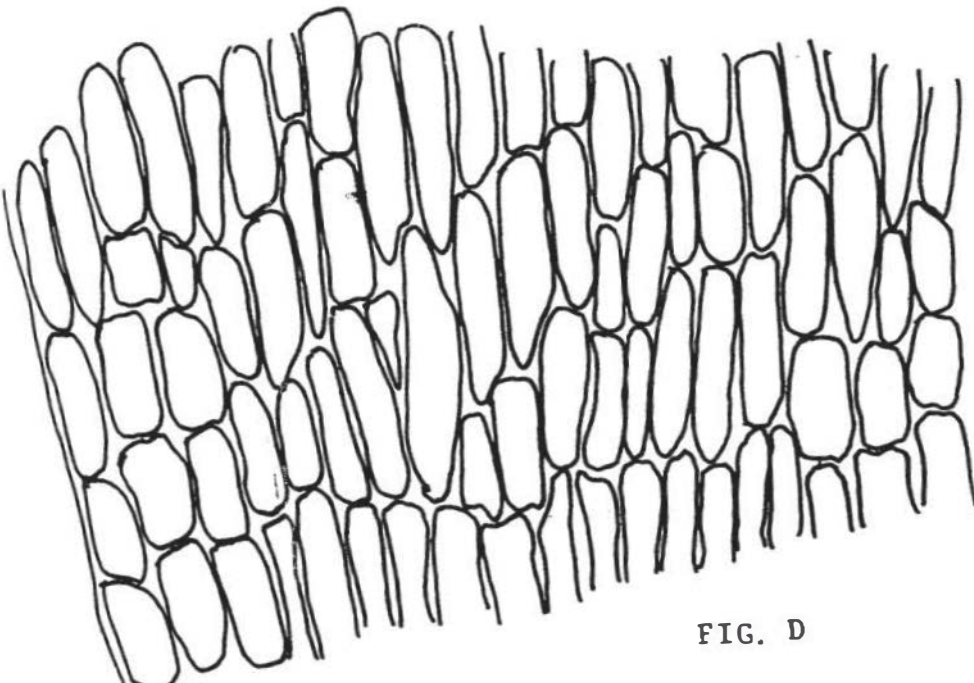


FIG. D

FAMILY: BRYACEAE

Bryum argentum Hedw.

Plants small, densely clustered, silvery, stems short, erect, red, the foliated branches terete, julaceous; leaves numerous, closely imbricate, very concave, broadly ovate, upper half colorless, lower half chlorophyllose, slightly or not at all decurrent, costa slender, ending in upper 1/3 of leaf, apices generally acuminate in slender point, margins plane but slightly reflexed in basal part, upper cells of leaves rhomboidal-hexagonal, with thin walls; lower rectangular, with thicker walls and especially thickened walls, up to 50 μ long and 15 μ wide, basal cells broader and short rectangular; dioicous; calyptra small, cucullate, fugacious; seta reddish, erect, slender, 1-1.5 cm. long; capsule reddish to light or dark brown; operculum convex or low conical, apiculate; urn oblong with short rounded neck, 1.5-2 mm. long; annulus of 3 rows of cells, deciduous; peristome double, up to 0.45 mm. high, teeth brownish yellow, pellucid; spores yellowish, nearly smooth, 10-18 μ in diameter, mature in winter or early spring.

Habitat: On dry soil, soil-covered rocks, ashes, and in crevices of brick and stone pavements, walks, walls or rooftops.

Illinois distribution: Carroll, Champaign, Clark, Coles, Cook, Fulton, Henderson, Kankakee, LaSalle, McDonough, Menard, Peoria, Sangamon, and Shelby Counties.

Bryum argentum Hedw.

Fig. A - Leaf - 104 X.

Fig. B - Apical cells - 260 X.

Fig. C - Median cells - 260 X.

Fig. D - Alar cells - 260 X.

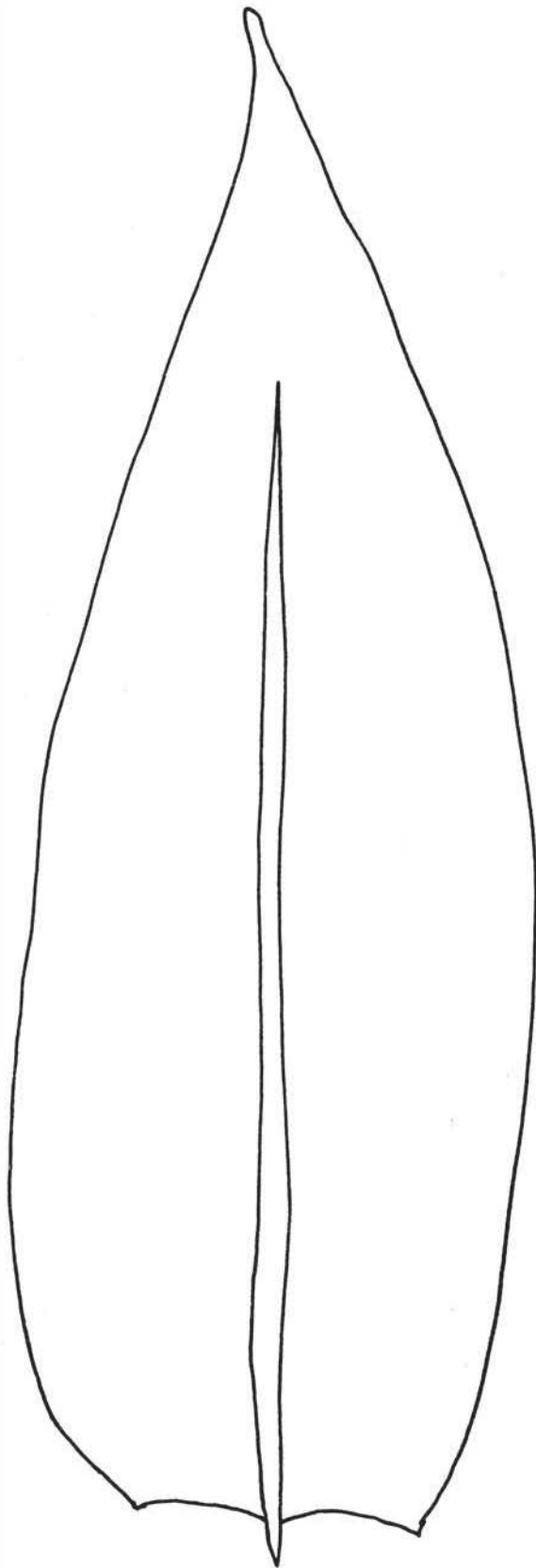


FIG. A

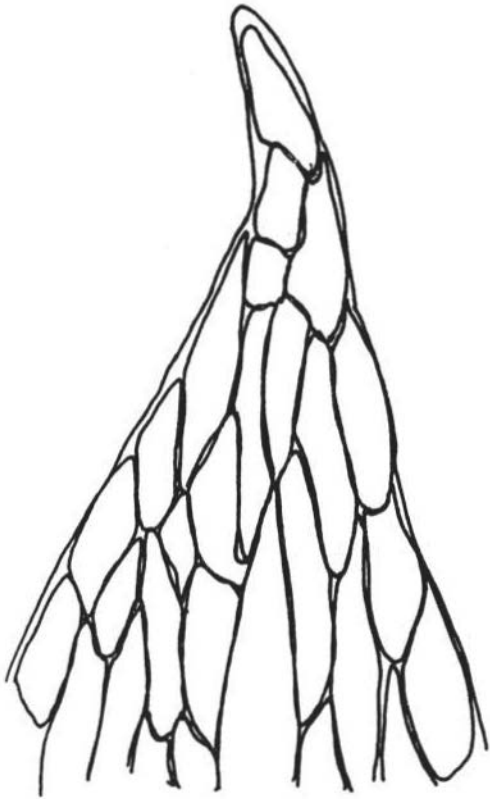


FIG. B

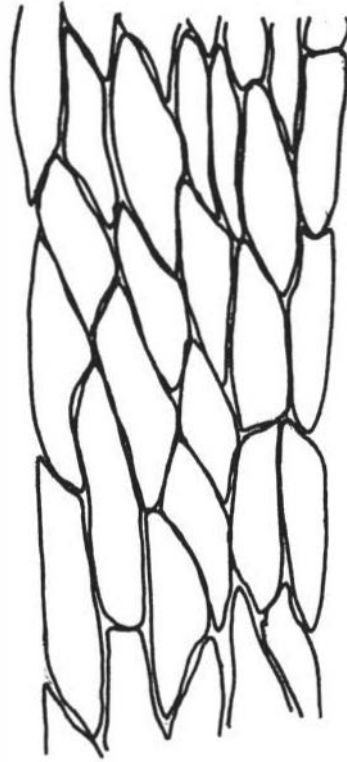


FIG. C

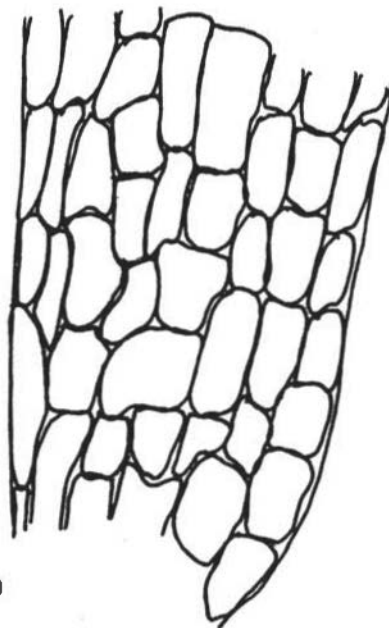
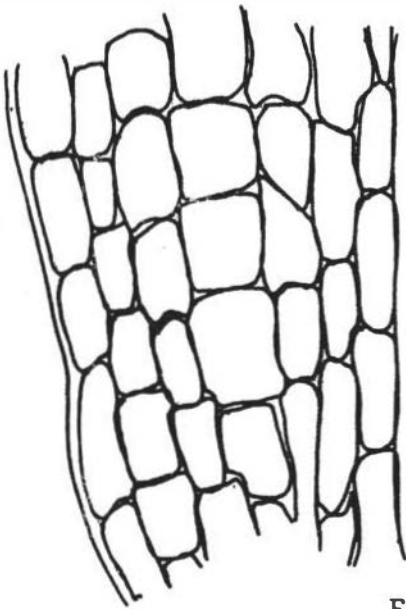


FIG. D

FAMILY: BRYACEAE

Bryum caespiticiu Hedw.

Plants in tufts, yellowish green; stems erect, not more than 1 cm. high, reddish above, leaves small and distant below, larger and densely tufted above, imbricate and only slightly twisted, lanceolate, concave, 3-3.5 mm. long, about 1 mm. wide, costa strong, reddish at base, yellowish above, generally long excurrent in a slightly toothed point, apices narrowly acuminate, margins strongly revolute, very slightly serrulate in apical portion; median cells of leaves narrowly rhomboidal, with thin walls 70 μ long by 10 μ wide, somewhat longer and narrower toward margins and apex, marginal cells linear, prosenchymatous, incrassate, in 1-3 rows, hardly forming a distinct border, especially at apex; dioicous; calyptra small, cucullate, fugaceous; seta reddish; capsule inclined, yellowish brown; urn obovoid, 3-4 mm. long; annulus of 2-3 rows of cells, deciduous; peristome double, up to 0.6 mm. high, teeth yellowish, linear-lanceolate, tapering into a slender apex; inner peristome hyaline; yellowish spores small, usually 7-14 μ in diameter, occasionally up to 17 μ , nearly smooth, generally maturing from May to July.

Habitat: On soil, stones, and walls.

Illinois distribution: Clark, Coles, Cook, DuPage, Fulton, Henry, Lake, LaSalle, Menard, Peoria, Rock Island, Sangamon, Shelby, and Will Counties.

Bryum caespiticum Hedw.

Fig. A - Leaf - 26.5 X.

Fig. B - Apical cells - 10⁴ X.

Fig. C - Median cells - 10⁴ X.

Fig. D - Alar cells - 10⁴ X.

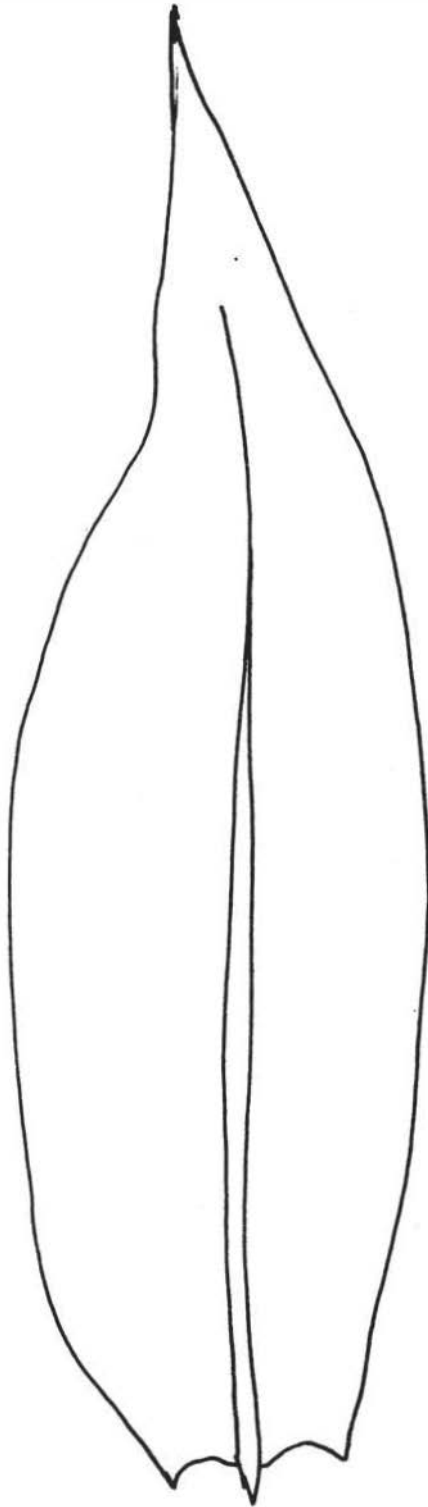


FIG. A

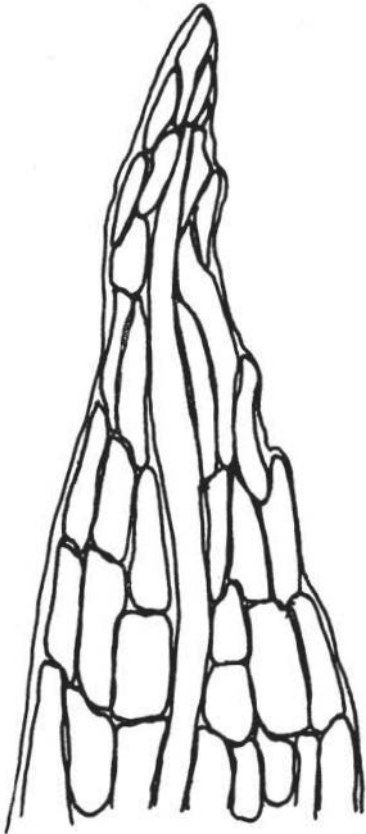


FIG. B

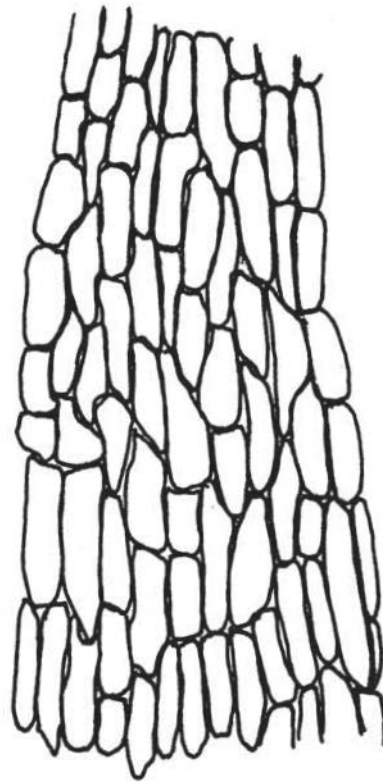


FIG. C

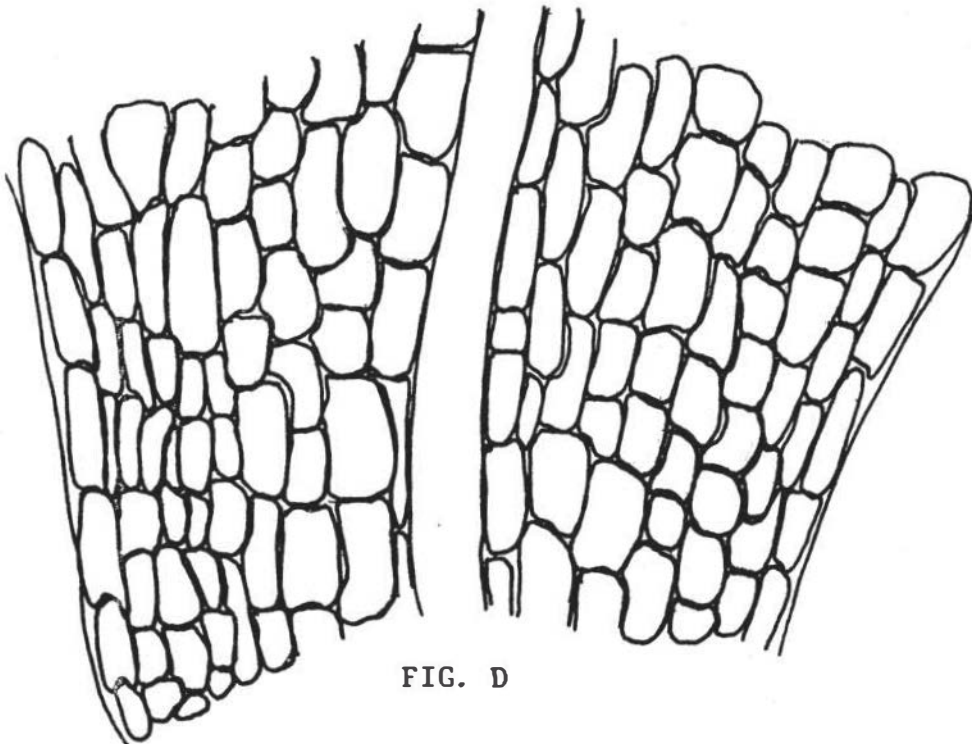


FIG. D

FAMILY: BRYACEAE

Bryum cuspidatum (B.S.G.) Schimp.

Plants closely tufted, green, short, usually up to 1 cm. high, branching with few slender innovations, brown-radiculose, leaves rather numerous, when dry moderately shrunken and twisted, the lower oblong-lanceolate, closely arranged in a rosette-like head, concave, 3-3.5 mm. long, approximately 1 mm. wide, briefly decurrent, costa strong, reddish, rather long excurrent in a smooth or slightly toothed point, apices slenderly acuminate, margins not noticeably revolute to revolute nearly to the tip of the leaf, entire below, subserrulate to serrulate above; median cells of leaves rhomboidal-hexagonal with thin nonpitted walls, rarely above 60 μ long, marginal cells linear, prosenchymatous, in 2-5 rows, forming a distinct border; synoicous; calyptra small, cucullate, dull brown; seta castaneous, 2-4.5 cm. long, capsule yellowish brown to dark brown, inclined; operculum convex, mammillate; annulus wide, deciduous; peristome double, up to 0.45 mm. high, teeth brownish yellow below, subhyaline and papillose, segments split, shorter than teeth; spores yellowish or brownish, minutely roughened, 10-14 μ in diameter, mature in early summer.

Habitat: Usually on or between wet rocks, occasionally on ground or decayed wood.

Illinois distribution: McDonough and Shelby Counties.

Bryum cuspidatum (B.S.G.) Schimp.

Fig. A - Leaf - 26.5 X.

Fig. B - Apical cells - 10⁴ X.

Fig. C - Median cells - 10⁴ X.

Fig. D - Alar cells - 10⁴ X.

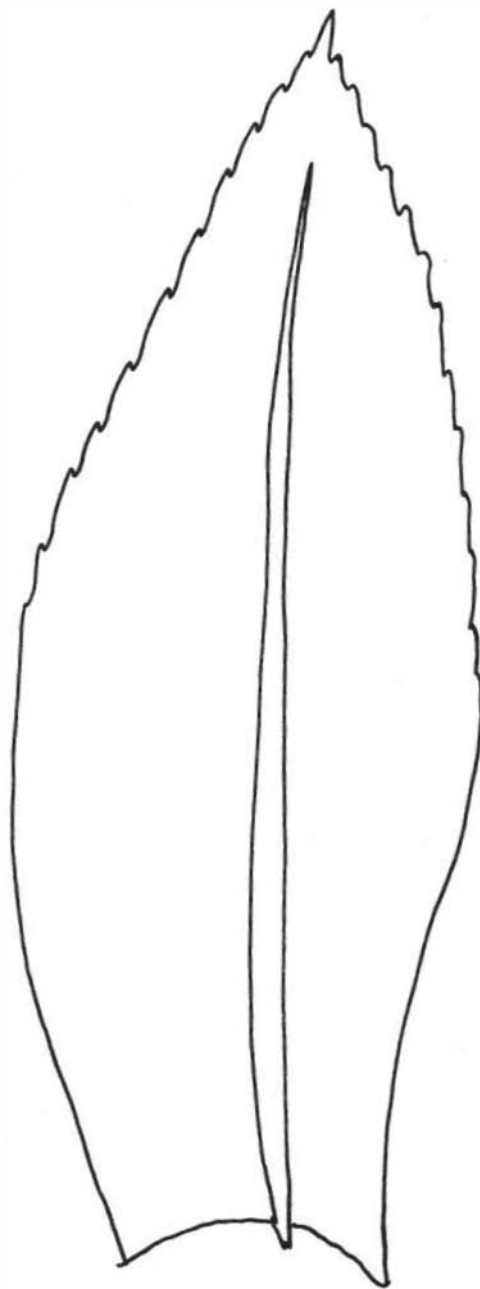


FIG. A

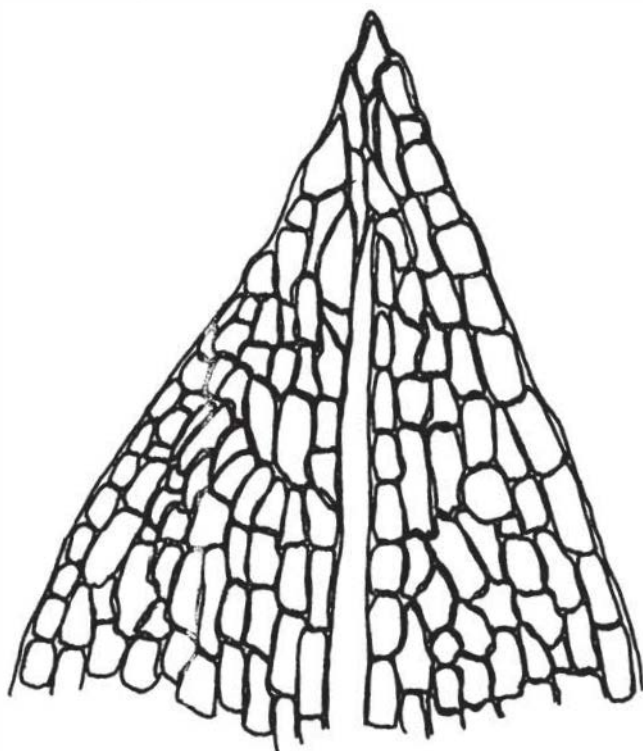


FIG. B

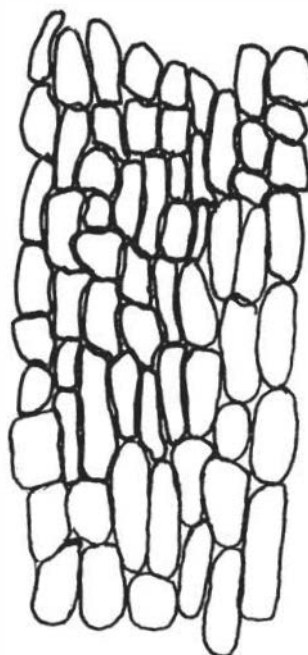


FIG. C

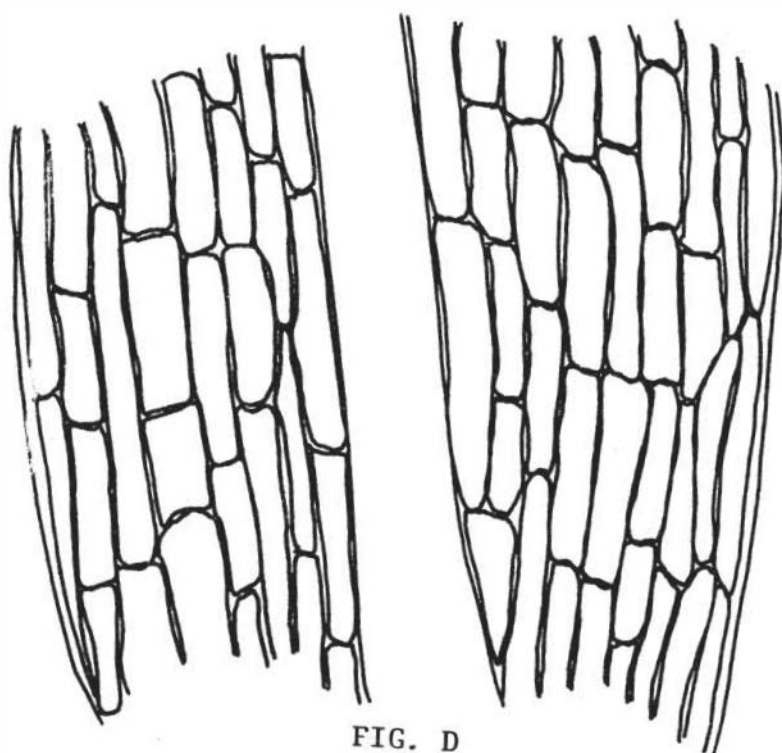


FIG. D

FAMILY: BRYACEAE

Bryum pseudotriquetrum (Hedw.) Schwaegr.

Plants dark green or tinged with red, stems erect, rigid, red, up to 8 cm. high, much matted with brown radicles, branches few; leaves somewhat shrunken and irregularly twisted and contorted when dry, erect-spreading to spreading when moist, distant below, closer above, ovate-lanceolate, concave, 2-3 mm. long, reddish throughout, or red at base and yellowish to brownish green above, strong, percurrent, to denticulate, cuspidate point, apices gradually acuminate, margins serrulate above, revolute to apex or nearly so; median cells of leaves rhomboidal, up to 50 μ long and 15 μ wide, with walls moderately thick, marginal cells yellowish-pellucid, linear, prosenchymatous, incrassate, in 3-4 rows forming a distinct border, basal cells red, rectangular, inflated; usually synoicous, sometimes dioicous; calyptra small, cucullate, fugacious; seta erect, chestnut brown, glossy, operculum large rounded, with a prominent point; annulus wide, deciduous; peristome double, up to 0.7 mm. high, teeth brownish yellow below, subhyaline and papillose above, segments broad, carinate, broadly fenestrate; spores brownish yellow, roughened, 14-20 μ in diameter, maturing in summer.

Habitat: In wet places, on soil, rock, or decaying wood.

Illinois distribution: Clark, Coles, Effingham and Shelby Counties.

Bryum pseudotriquetrum (Hedw.) Schwaegr.

Fig. A - Leaf - 40 X.

Fig. B - Apical cells - 160 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

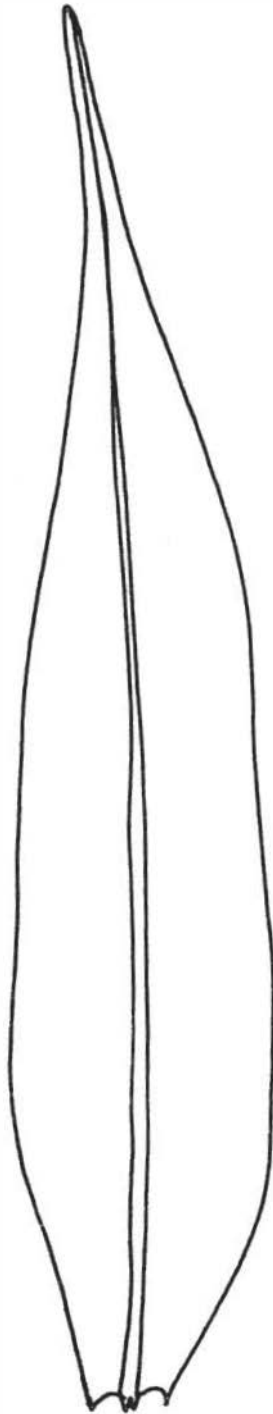


FIG. A

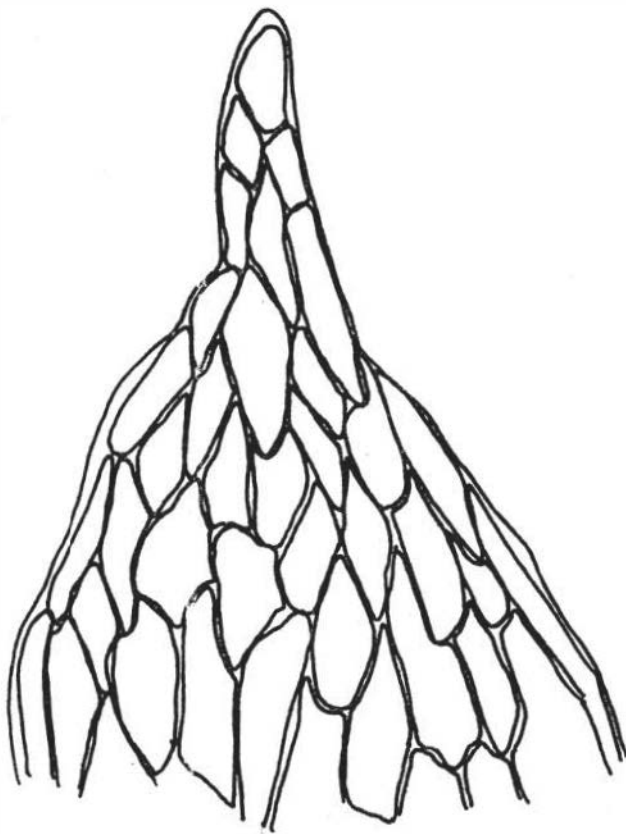


FIG. B

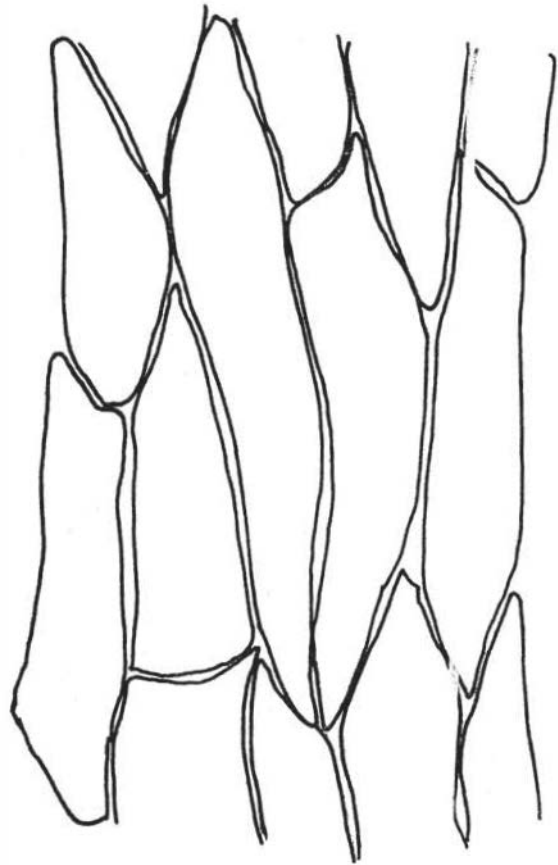


FIG. C



FIG. D

FAMILY: BRYACEAE

Pohlia nutans (Hedw.) Lindb.

Plants in loose tufts, dark green, or yellowish green; stems erect, reddish, simple or with basal or lateral branches, up to 2 cm. high, occasionally up to 5 cm., brown radiculose below; leaves slightly shrunk, twisted, and glossy when dry, erect, imbricate, ovate-lanceolate above, 3-4 mm. long and approximately 0.6 mm. wide, not decurrent or slightly so, costa rather strong, usually ending below apex, apices acuminate, margins slightly reflexed, at least in lower part, entire below, denticulate above; median cells of leaves linear, long rhomboidal or elongate-hexagonal, up to 70 μ long and 10 μ wide; parocious or autoicous; antheridia generally in pairs in axils of perichaetial leaves; calyptra cucullate, generally smooth and fugacious; seta erect, often curved, reddish brown, up to 4 cm. long; capsule horizontal to pendulous, yellowish, light brown or brown; operculum convex, mammillate, or apiculate; urn pyriform, oblong, or obovate, symmetrical to slightly curved, 3-4 mm. long, contracted below mouth when dry, neck not strongly differentiated, normally shorter than rest of capsule; annulus biseriate, deciduous; peristome double, up to 0.54 mm. long, teeth yellowish orange, rather abruptly narrowed above, papillose segments of inner peristome light yellow, basal membrane $1/3$ - $1/2$ height of teeth, cilia 2-3, nearly as long as segments, nodulose; spores yellowish, nearly smooth, about 14-24 μ in diameter, maturing in early summer.

Habitat: On peaty and sandy soil, rocks, and decaying wood, in moist or swampy places.

Illinois distribution: Christian, Clark, Coles, Cook, Fulton, Lake, McHenry, Menard, and Shelby Counties.

Pohlia nutans (Hedw.) Lindb.

Fig. A - Leaf - 40 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 160 X.

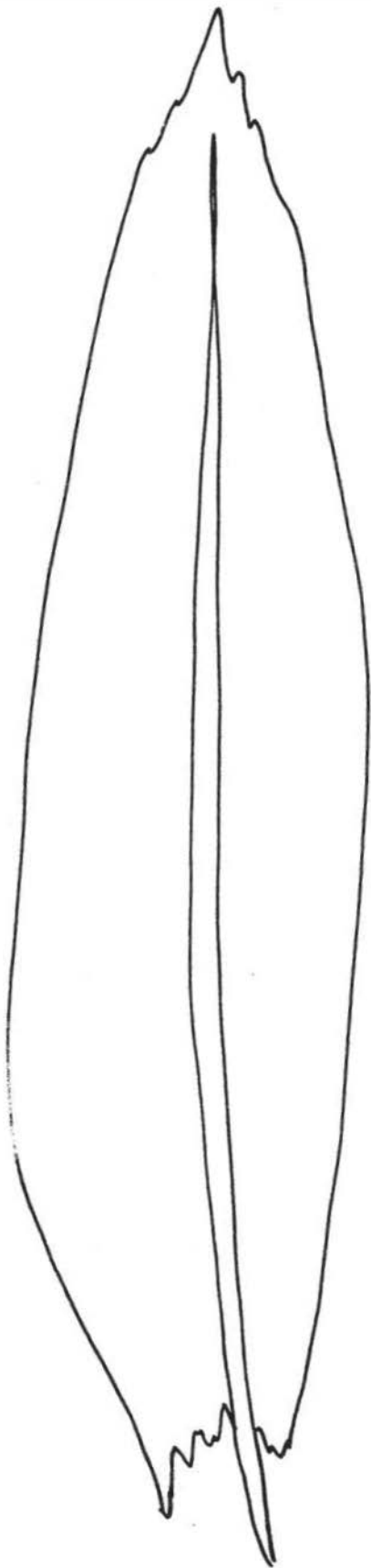


FIG. A

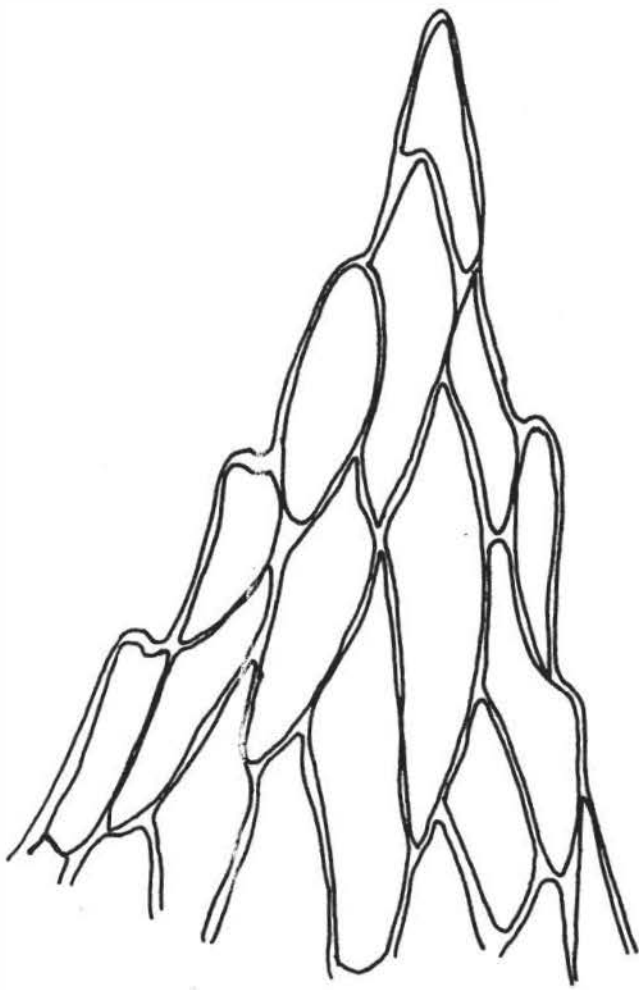


FIG. B

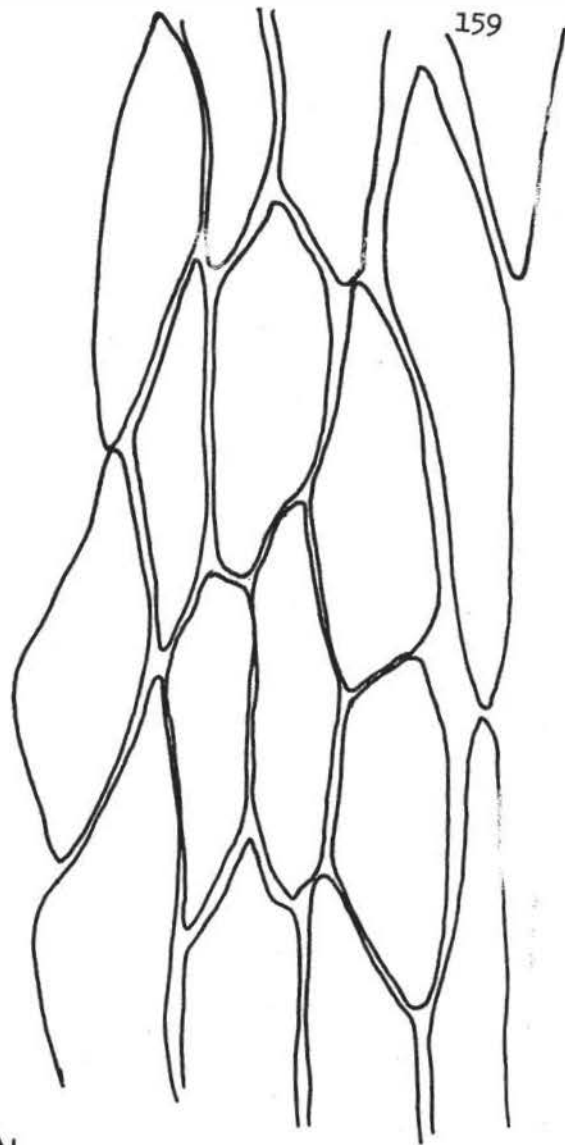


FIG. C

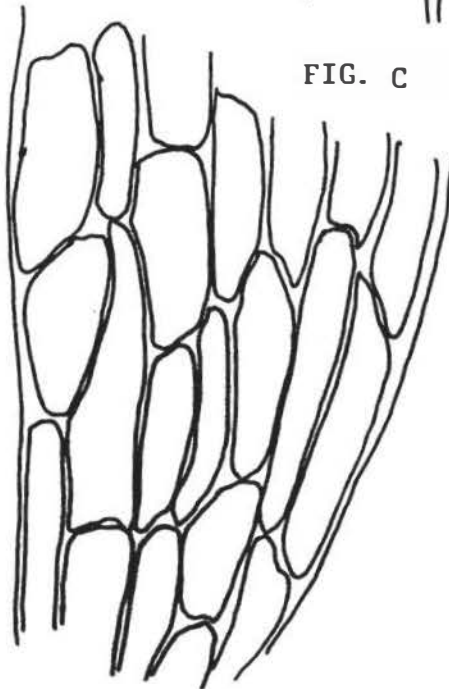
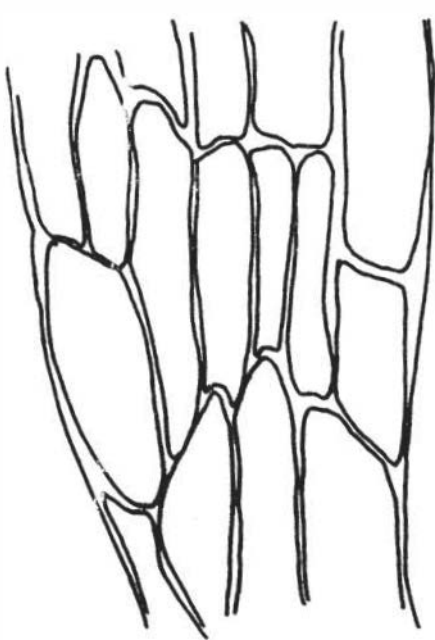


FIG. D

FAMILY: BRYACEAE

Pohlia wahlenbergii (Web. & Mohr.) Andrews

Plants slender, in large, soft, lax, glaucous-green; not glossy; stems erect, reddish to castaneous, bright red with age, 2-8 cm. long, branched below and matted with abundant brownish tomentum; leaves numerous, distant, shrunken when dry, spreading, narrowly to broadly ovate-lanceolate, up to 3.5 mm. long and 1 mm. wide, narrowed at base and slightly decurrent, costa strong, green and reddish above, ending a little below the obtusely acute apex, margins plane, entire below, serrate above; median cells of leaves pellucid, rhombic-hexagonal, approximately 100 μ long, 15-25 μ wide, with thin walls, basal cells often reddish; dioicous; male plants often branching by innovations; antheridial clusters terminal, discoid, perigonal bracts wide spreading; calyptra small, cucullate, fugacious; seta erect, yellowish to reddish brown, 2-4 cm. high, abruptly hooked at the summit; capsule pendent, reddish brown when ripe, about as broad as long; operculum convex, apiculate; urn oval to shortly and broadly pyriform, 1.5-2.5 mm. long, the neck inconspicuous, short and broad mouth wide when urn is dry and empty; annulus none; peristome yellowish, papillose, segments narrow, carinately split, same length as teeth, cilia 2-4, approximate length of the segments, sometimes connected at apices, slightly nodulose, papillose, not appendiculate, spores brownish yellow, nearly smooth to papillose, walls rather thin, 14-25 μ in diameter, maturing in late spring or early summer.

Habitat: In water and wet places, such as ditches, springs, wet clay banks, etc.

Illinois distribution: Shelby County.

Pohlia wahlenbergii (W.&M.) Andrews

Fig. A - Leaf - 160 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

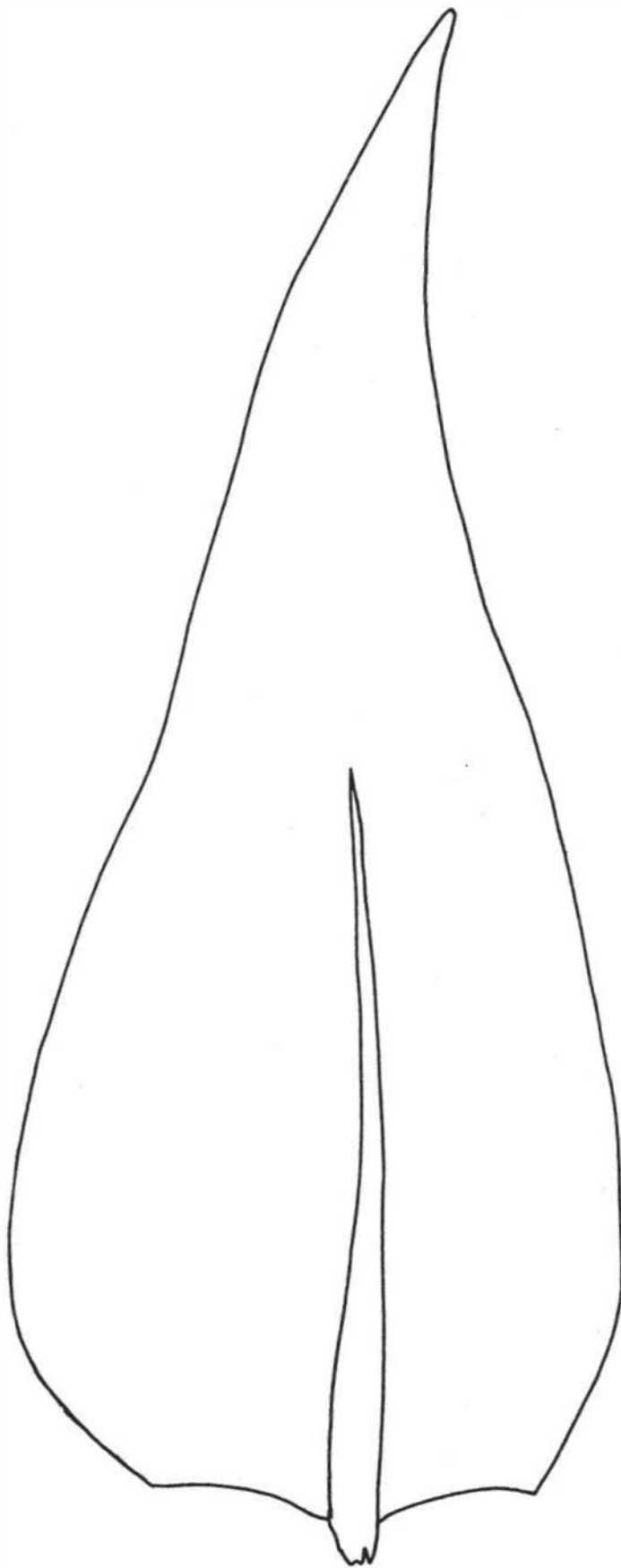


FIG. A

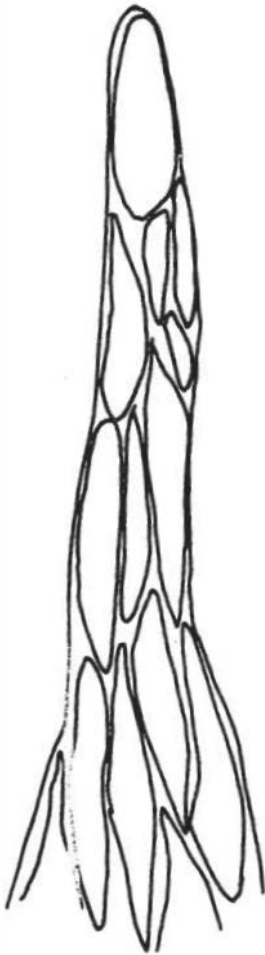


FIG. B

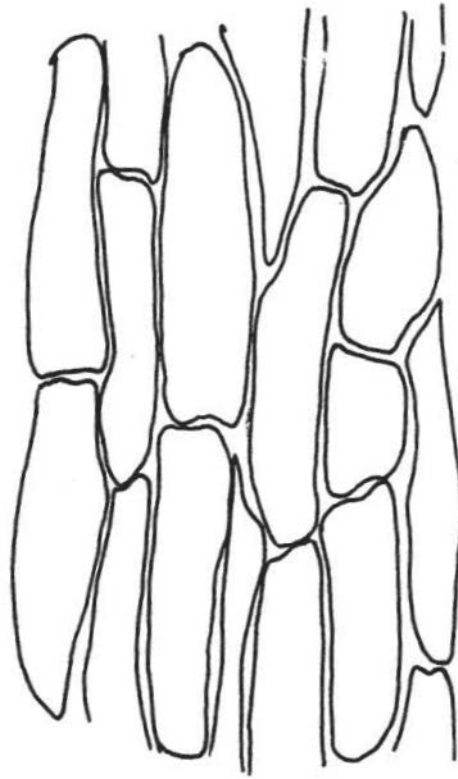


FIG. C

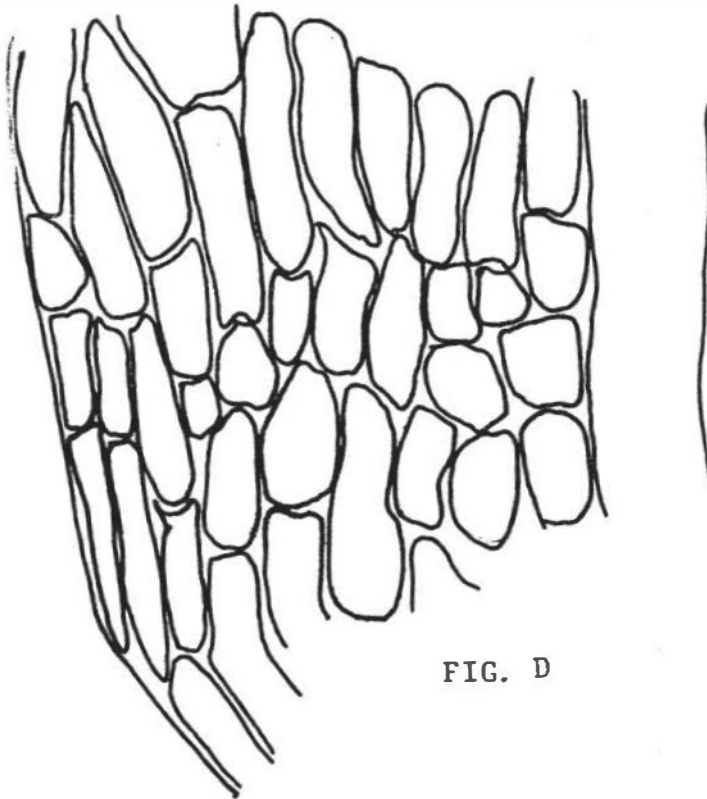


FIG. D

FAMILY: BRYACEAE

Rhodobryum roseum (B.S.G.) Limpr.

Plants loosely tufted, dark green; stems stout, erect from long creeping rhizome-like stolons, 2-5 cm. high, with minute appressed bract-like leaves up to the summit, densely purplish brown radiculose below; leaves numerous, in a conspicuous terminal rosette about 1 cm. in diameter, contorted when dry, spreading when moist, obovate-spatulate from a narrow base, up to 5 mm. long, costa strong at base, ending slightly below apex of leaf, percurrent in the sharp point, ending abruptly and narrowed and acuminate, twisted, margins revolute $3/4$ length of leaf, plane above, entire below, sharply spinulose-dentate above; median cells elongate-hexagonal, up to 100 μ long and 40 μ wide with thick walls, strongly pitted, diminishing in width toward margins, forming a border of 1-2 rows of narrow cells; dioicous; calyptra small, cucullate, fugacious; seta erect, reddish brown, lustrous, 2-5 cm. long; capsule pale brown, horizontal to pendulous, up to 7 mm. long; operculum convex-conical, apiculate; urn oblong-cylindrical to cylindrical, incurved slightly, 2-4 cm. long, slightly contracted beneath mouth when empty and abruptly narrowed below; neck narrow, incurved, approximately $1/3$ length of rest of capsule; annulus wide, deciduous; peristome double, teeth large, yellowish to brown, linear-lanceolate, tapering to hyaline tip, narrowly bordered, inner peristome yellow, carinately split; spores brownish yellow, slightly roughened, 18-25 μ in diameter, mature in late autumn or winter.

Habitat: In moist, shaded spots, on soil, on decayed logs, rich humus, bark of trees, and occasionally on stones.

Illinois distribution: Clark, Coles, Cook, Fulton, Kane, LaSalle, McHenry, Menard, Peoria, Sangamon, Shelby, and Union Counties.

Rhodobryum roseum (B.S.G.) Limpr.

Fig. A - Leaf - 26.5 X.

Fig. B - Apical cells - 260 X.

Fig. C - Median cells - 260 X.

Fig. D - Alar cells - 260 X.

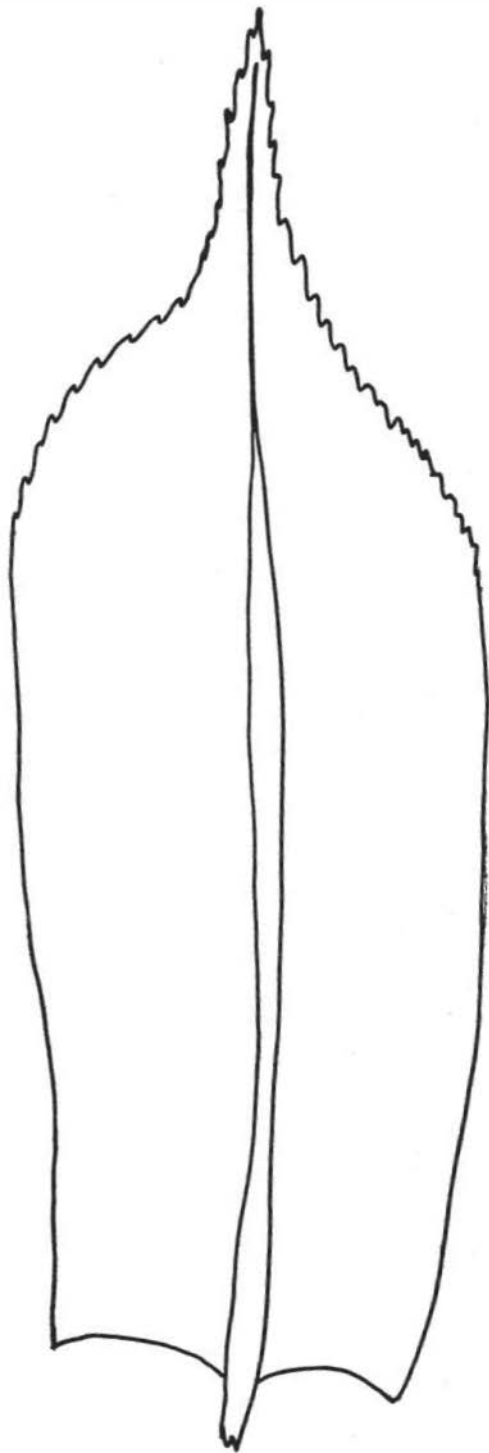


FIG. A

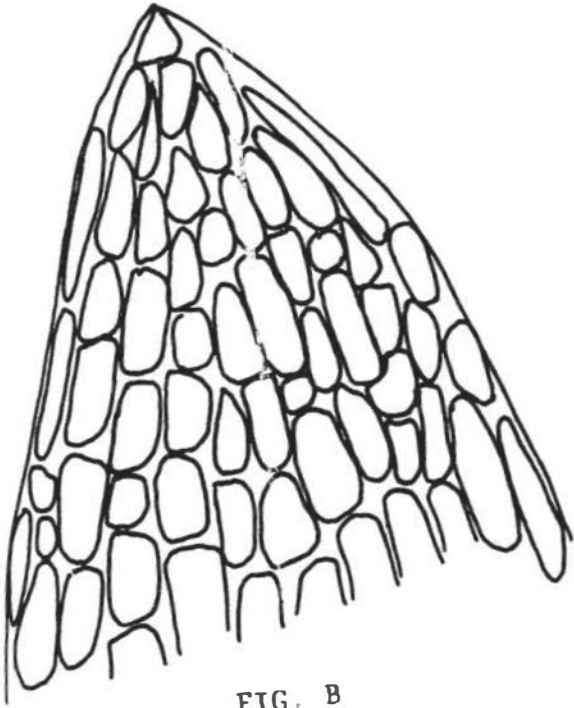


FIG. B

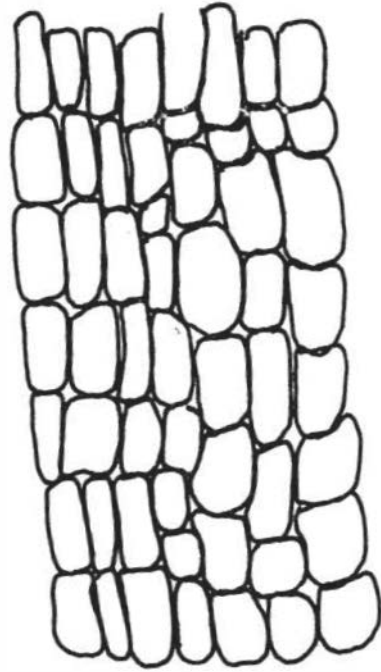


FIG. C

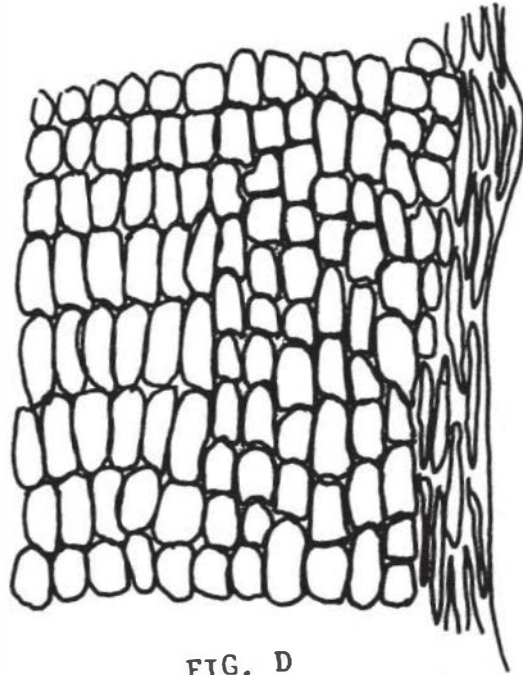


FIG. D

FAMILY: MNIACEAE

Mnium affine Bland.

Plants moderately large, close tufts, green; fertile stems erect or nearly so, up to 3 cm. or more high, radiculose below; leaves small and distant below, becoming larger and closer above and forming a terminal rosette, irregularly distorted when dry, spreading, on fertile stems ovate, 6-10 mm. long, bases narrowed, decurrent, costa strong, percurrent, apices cuspidate, border unistratose, of 2-5 rows of linear, pro-senchymatous cells, margins usually toothed throughout with a row of sharp, distinct, slender teeth of 1-4 cells each, median cells of leaves hexagonal, in rows, radiating from costa, cell walls moderately thick, usually 20-40 μ , largest cells near costa; dioicous; antheridial flower terminal, discoid; calyptra cucullate, fugacious, seta erect; capsule pendulous; operculum short; urn oblong, narrowed to a short neck, 4-5 mm. long; annulus biserate; peristome double, teeth greenish yellow, 16, densely papillose, up to 1 mm. long, inner peristome orange to brownish, pellucid, densely papillose, cuspidate; spores yellowish pellucid, finely papillose, 22-32 μ in diameter, maturing in spring.

Habitat: On moist, shaded rock, soil, logs, stumps, and tree trunks, in woods, meadows, and swamps.

Illinois distribution: Champaign, Clark, Coles, Cook, Fulton, Jackson, Kankakee, Menard, Peoria, Pope, and Shelby Counties.

Mnium affine Bland.

Fig. A - Leaf - 36 X.

Fig. B - Apical cells - 104 X.

Fig. C - Median cells - 260 X.

Fig. D - Alar cells - 260 X.

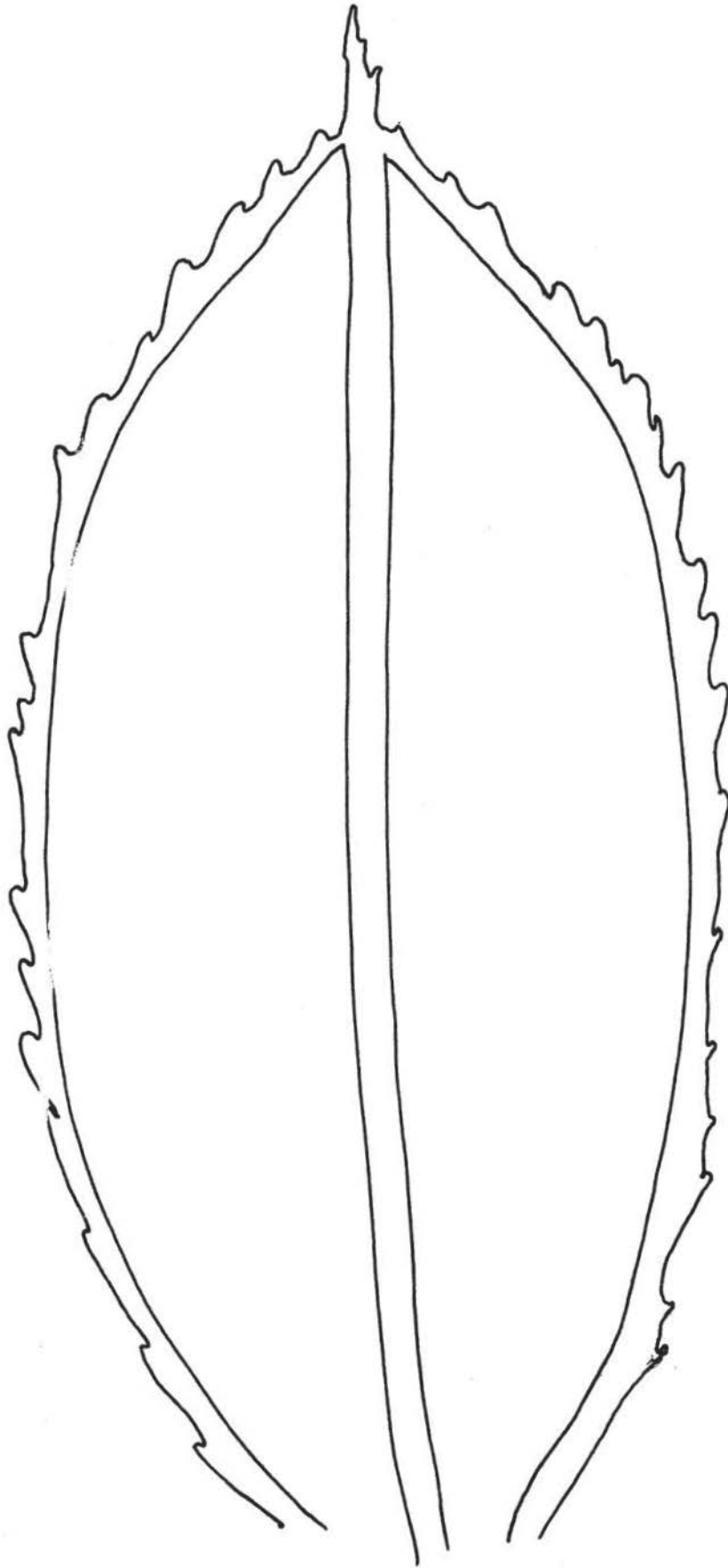


FIG. A

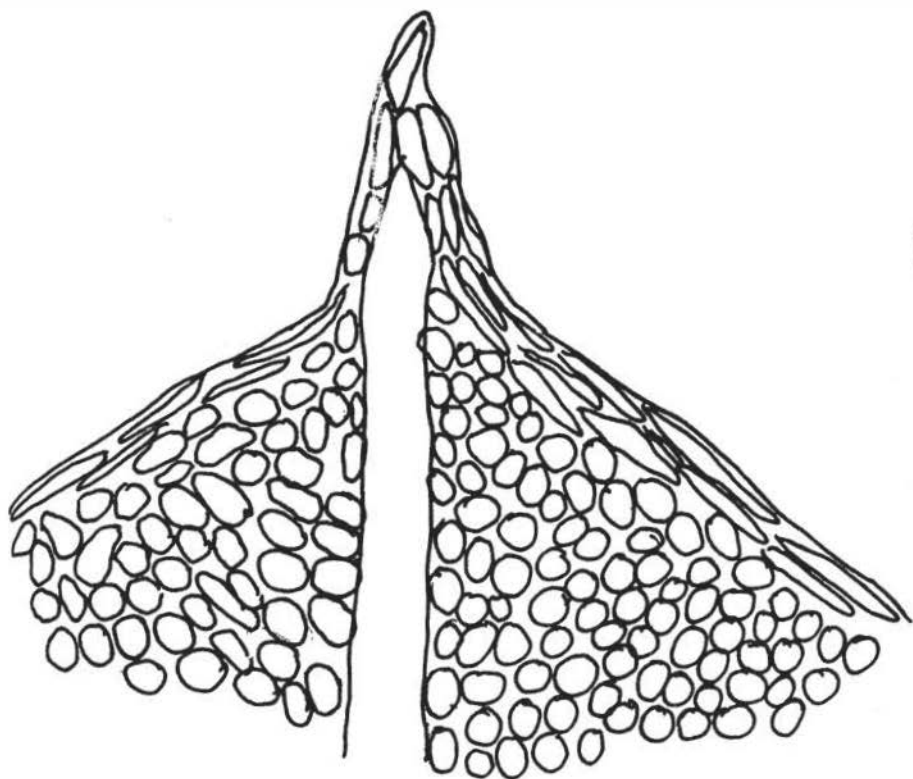


FIG. B

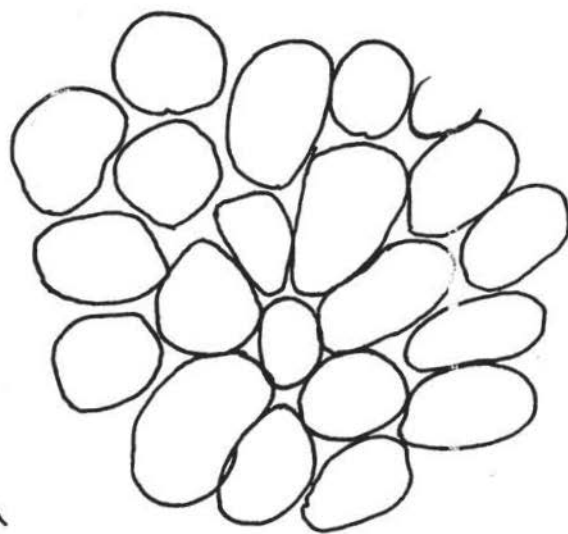


FIG. C



FIG. D

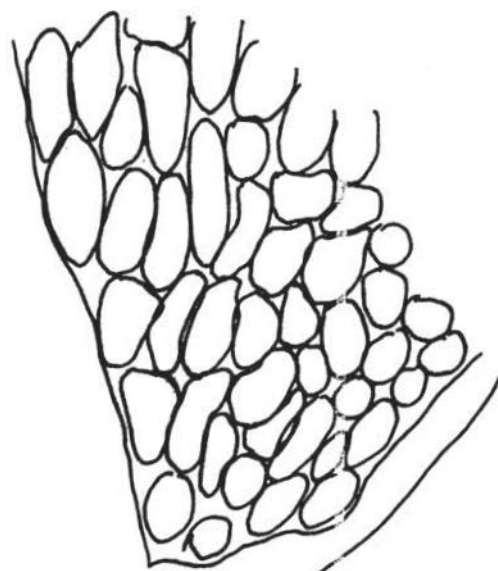
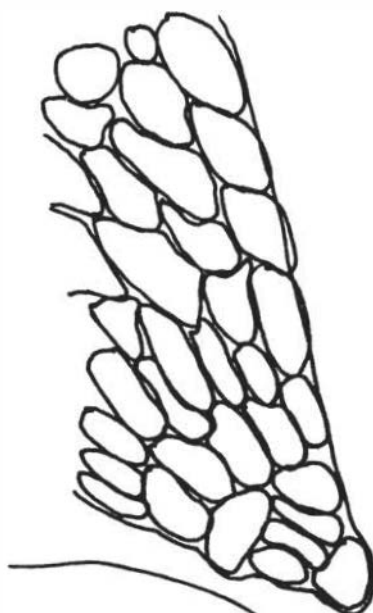


FIG. D

Mnium affine Bland. var. rugicum (Laur.) R.S.G.

Leaves entire or only with a few obtuse, almost obsolete teeth, broadly oval, oblong, or suborbicular, and margins are slightly to not at all serrate.

Habitat: On moist, shaded rock, soil, logs, stumps, and tree trunks, in woods, meadows, and swamps.

Illinois distribution: Clark, Coles, and Shelby Counties.

Mnium affine Bland. var. rugicum (Laur.) B.S.G.

Fig. A - Leaf - 40 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

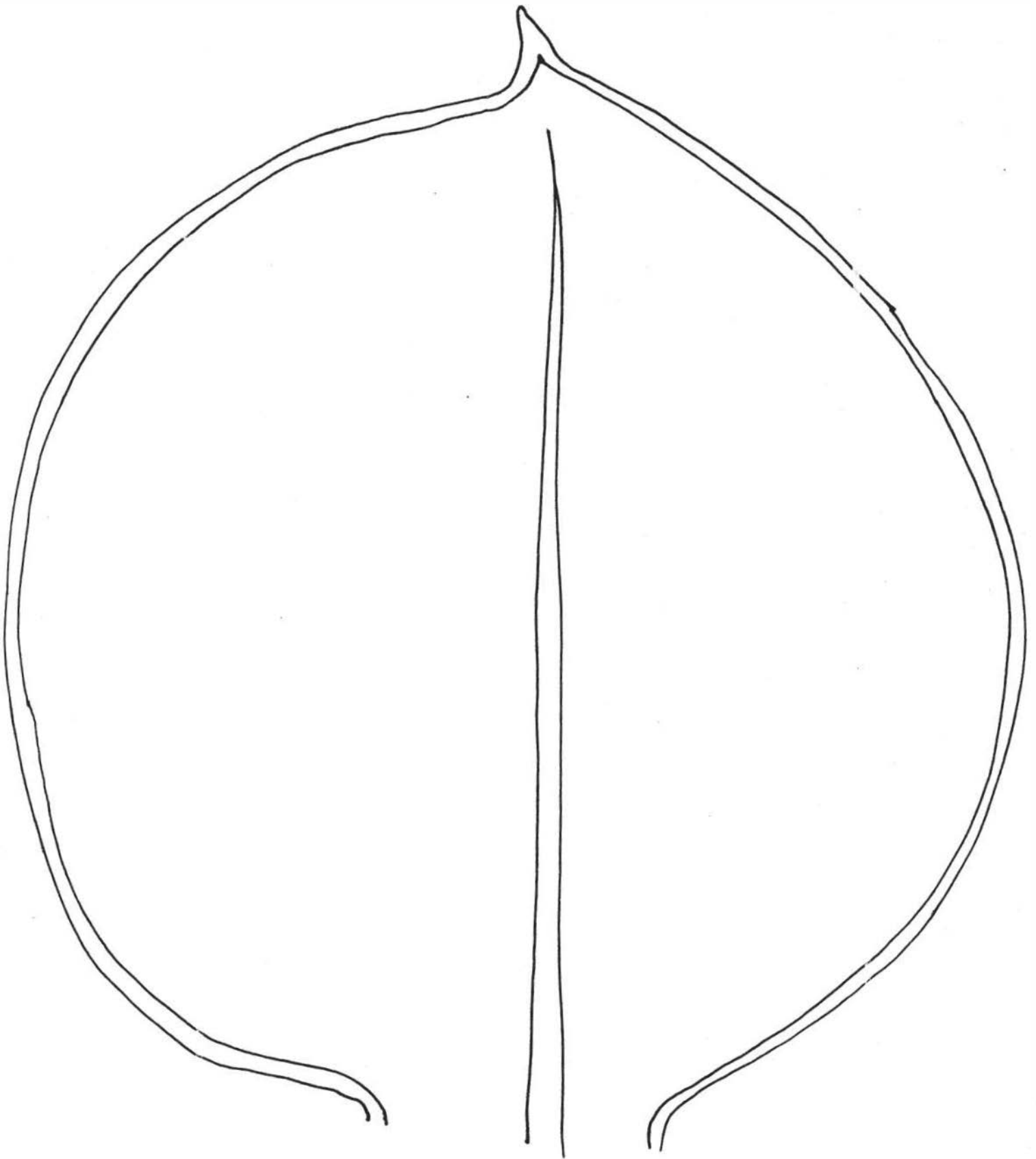


FIG. A

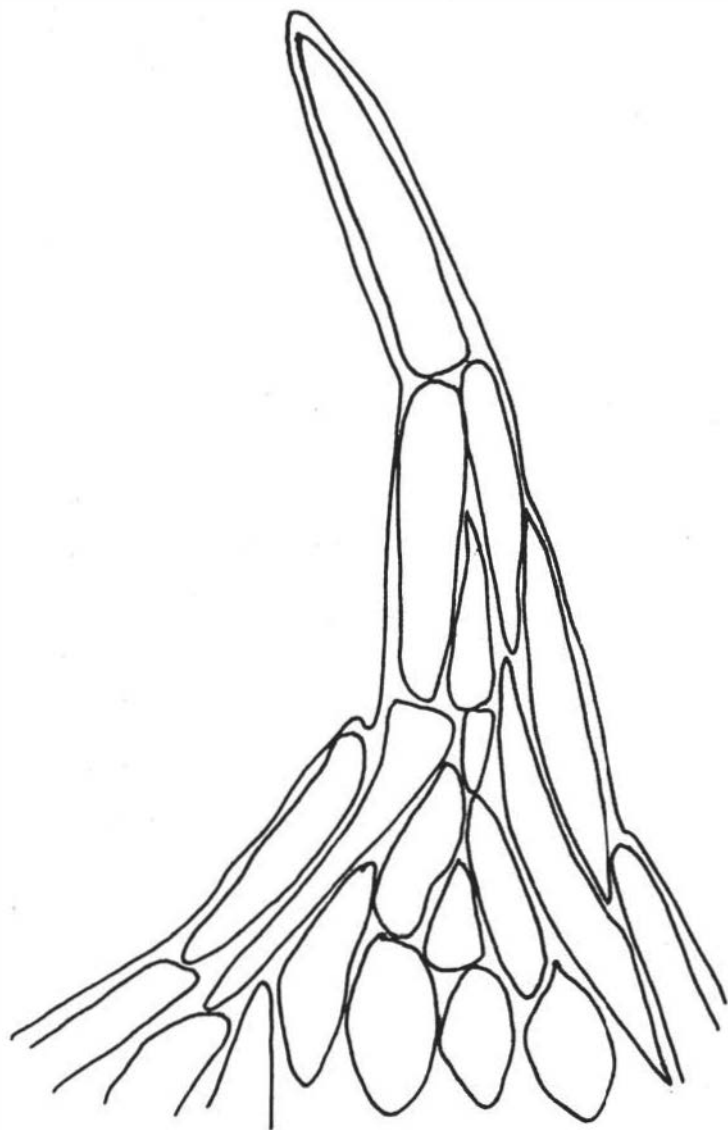


FIG. B

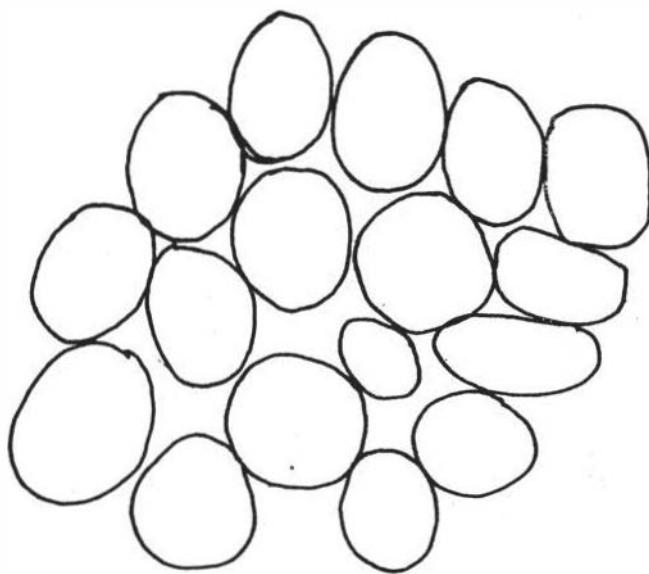


FIG. C

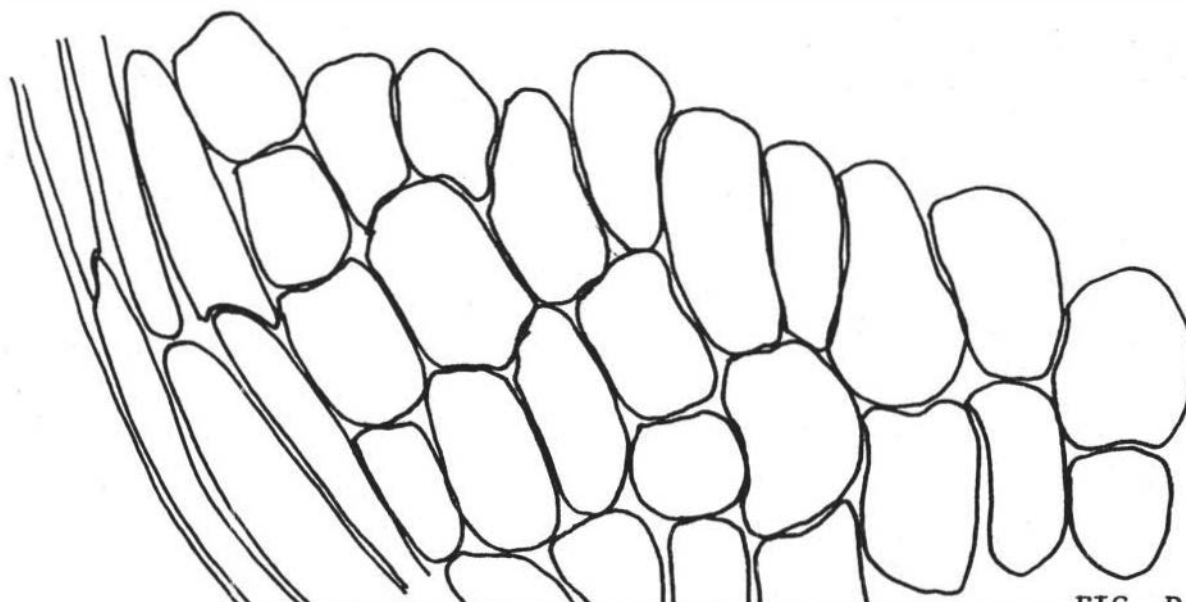


FIG. D

FAMILY: MNIACEAE

Mnium cuspidatum Hedw.

Plants often in large mats or tufts, light to yellowish green; fertile stems reddish, simple, erect, radiculose below, sterile shoots elongated, suberect, creeping or deflexed; leaves few, distant at the basal end of stem and gradually closer together until a rosette is reached, crisped and distorted when dry, spreading when moist, obovate, 2-4 mm. long, bases narrow, decurrent, costa strong, ending below the apex, confluent with border in apiculate apex, apices acute, border unistratose, of 2-5 rows of linear cells, margin serrate in upper 1/2 with 1-celled teeth, median cells of leaves collenchymatous, irregularly rounded hexagonal, with rather thick walls, 20-25 μ in diameter, with larger cells intermingled; synoicous; calyptra cucullate, inconspicuous, fugacious; seta single, erect slightly reddish yellow up to 3 cm. high; capsule subpendulous, yellowish brown when mature; operculum rather large, conic, obtuse; urn oval, up to 3.5 mm. long, neck very short; annulus of 3-4 rows of cells, deciduous in pieces; peristome double, teeth greenish yellow, 16, linear-lanceolate, papillose, about 0.8 mm. long, inner peristome reddish yellow to brown, papillose, segments carnate, ending in an awn-like tip; spores yellow, faintly papillose, 20-28 μ in diameter, maturing in April or May.

Habitat: In moist, shaded places, on soil, stones, and rotten wood.

Mnium cuspidatum Hedw.

Fig. A - Leaf - 26.5 X.

Fig. B - Apical cells - 260 X.

Fig. C - Marginal tooth - 260 X.

Fig. D - Median cells - 260 X.

Fig. E - Alar cells - 260 X.

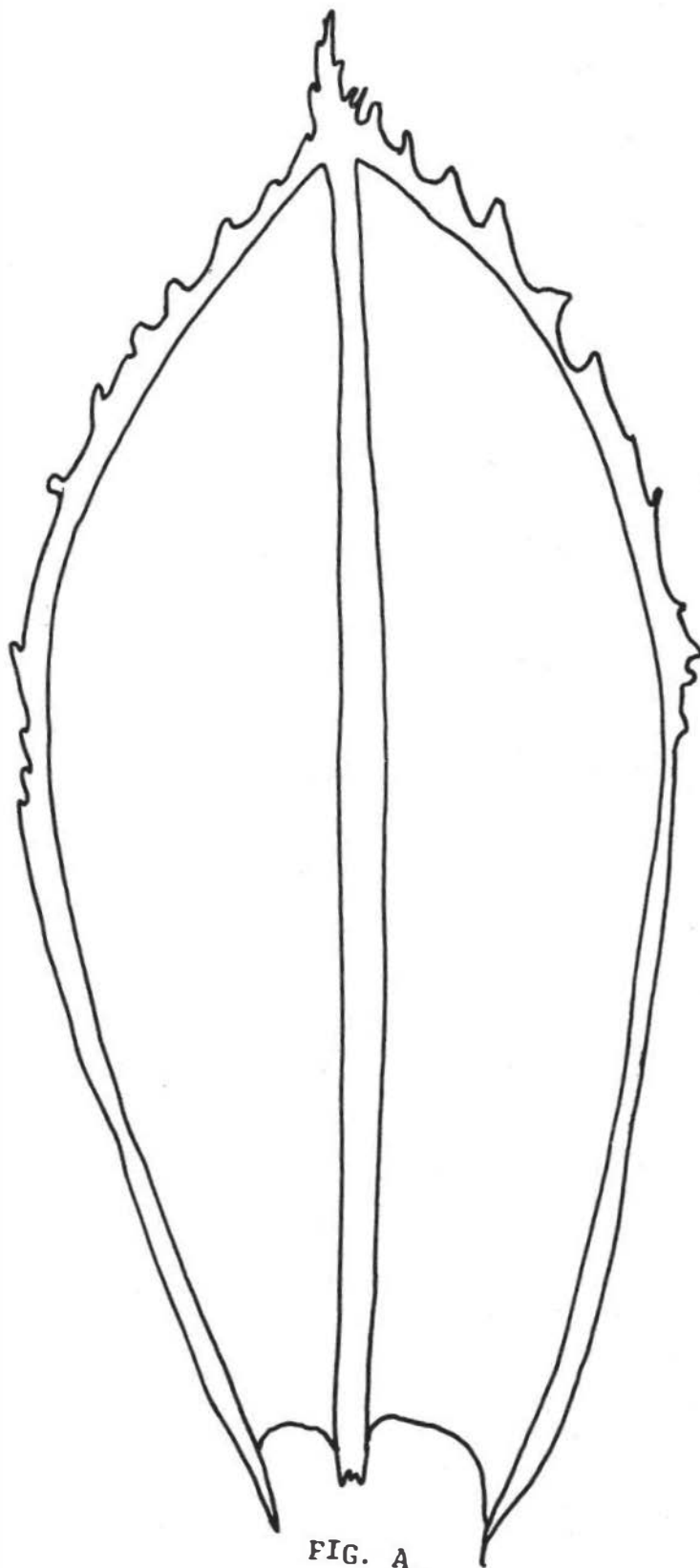


FIG. A

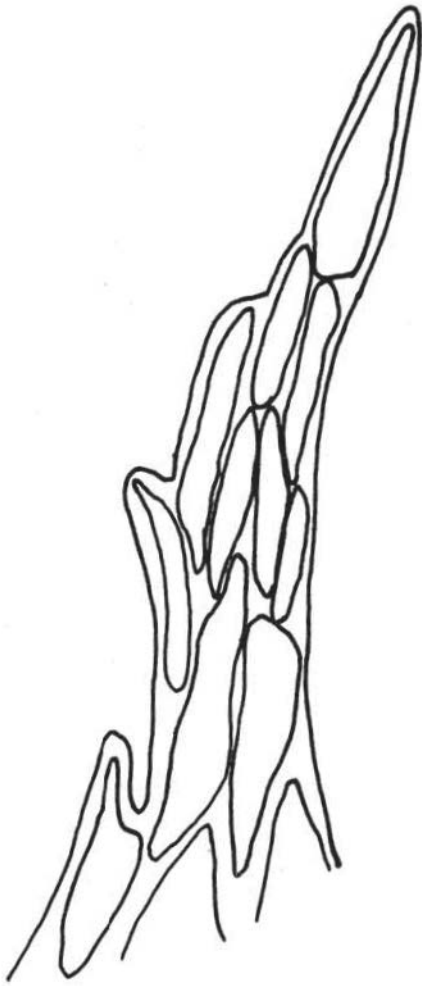


FIG. B

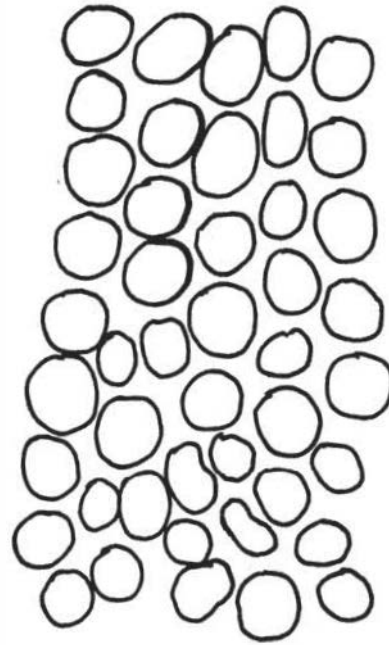


FIG. C

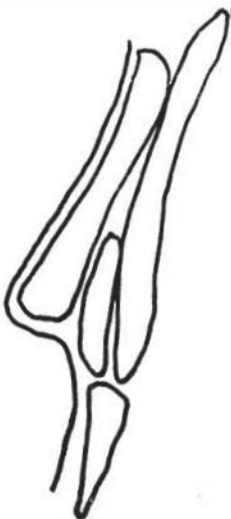


FIG. E

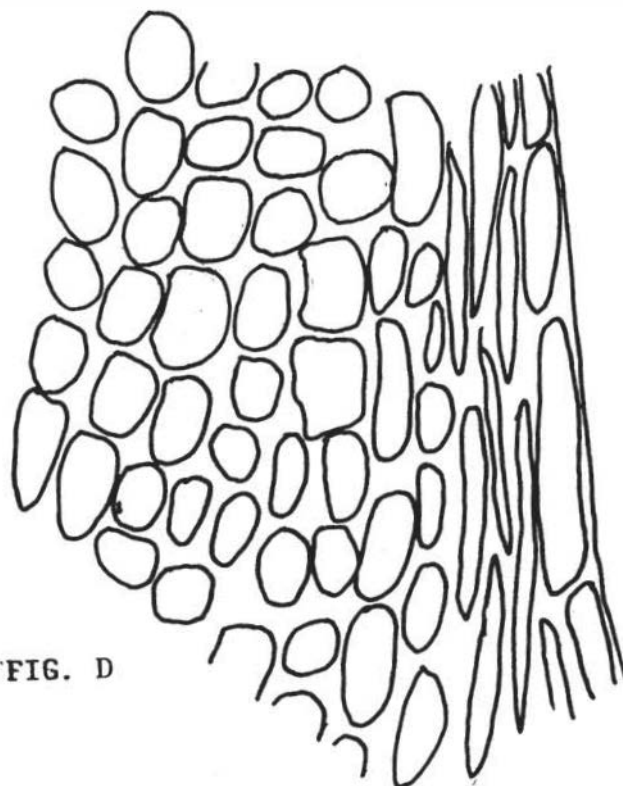


FIG. D

FAMILY: MNIACEAE

Mnium punctatum Hedw.

Plants rather large, in loose tufts, whitish green to dark green, stems erect, rigid, reddish, mostly simple, 2.5-7.5 cm. high, densely brown tomentose nearly to apex; leaves distant except in terminal rosette, somewhat wrinkled and distorted when dry, lower smaller, rounded-ovate, the rosulate spreading, oval, broadly obovate, 6-9 mm. long, 4-5 mm. wide, gradually narrowing to base, not decurrent, costa strong below, percurrent, ending in apiculus, or ceasing just below tip, the apices broadly rounded to slightly emergent, usually apiculate, border brownish, of 1-5 rows of elongated, incrassate cells, one to several layers of cells in thickness, margins entire; median cells of leaves rounded hexagonal, 50-150 μ long, 30-50 μ wide, incrassate or pitted, corners not thickened or slightly so, in obliquely ascending rows from costa to border; dioicous; calyptra cucullate, inconspicuous, fugacious; seta erect, brownish or reddish, rather glossy, 2-4 cm. long, 1-3 from same perichaetium; capsule horizontal to pendulous, yellowish, or brownish with age; operculum conic, acutely rostrate; urn ovoid, up to 5 mm. long, slightly furrowed when dry, neck short and inconspicuous; annulus of 1-3 rows of cells; peristome double, teeth 16, yellowish brown, about 0.6 mm. long, pellucid, papillose, the papillae, sometimes appearing to be in longitudinal striae in upper part, inner peristome, golden yellow, pellucid, finely papillose, segments carinate fenestrate, narrow and gradually tapering to slender

apex, approximate length of teeth, basal membrane up to 1/2 height of segments, cilia 2-3, somewhat nodulose, slightly shorter than segments; spores brownish yellow; slightly roughened, 28-40 μ in diameter; maturing in winter or spring, April or May.

Habitat: On soil, sand, and rocks, in damp woods, ravines and swamps, often on moist stones in beds of brooks.

Illinois distribution: Clark, Coles, Jackson, Menard, and Shelby Counties.

Mnium punctatum Hedw.

Fig. A - Leaf - 26.5 X.

Fig. B - Apical cells - 10⁴ X.

Fig. C - Median cells - 10⁴ X.

Fig. D - Alar cells - 10⁴ X.

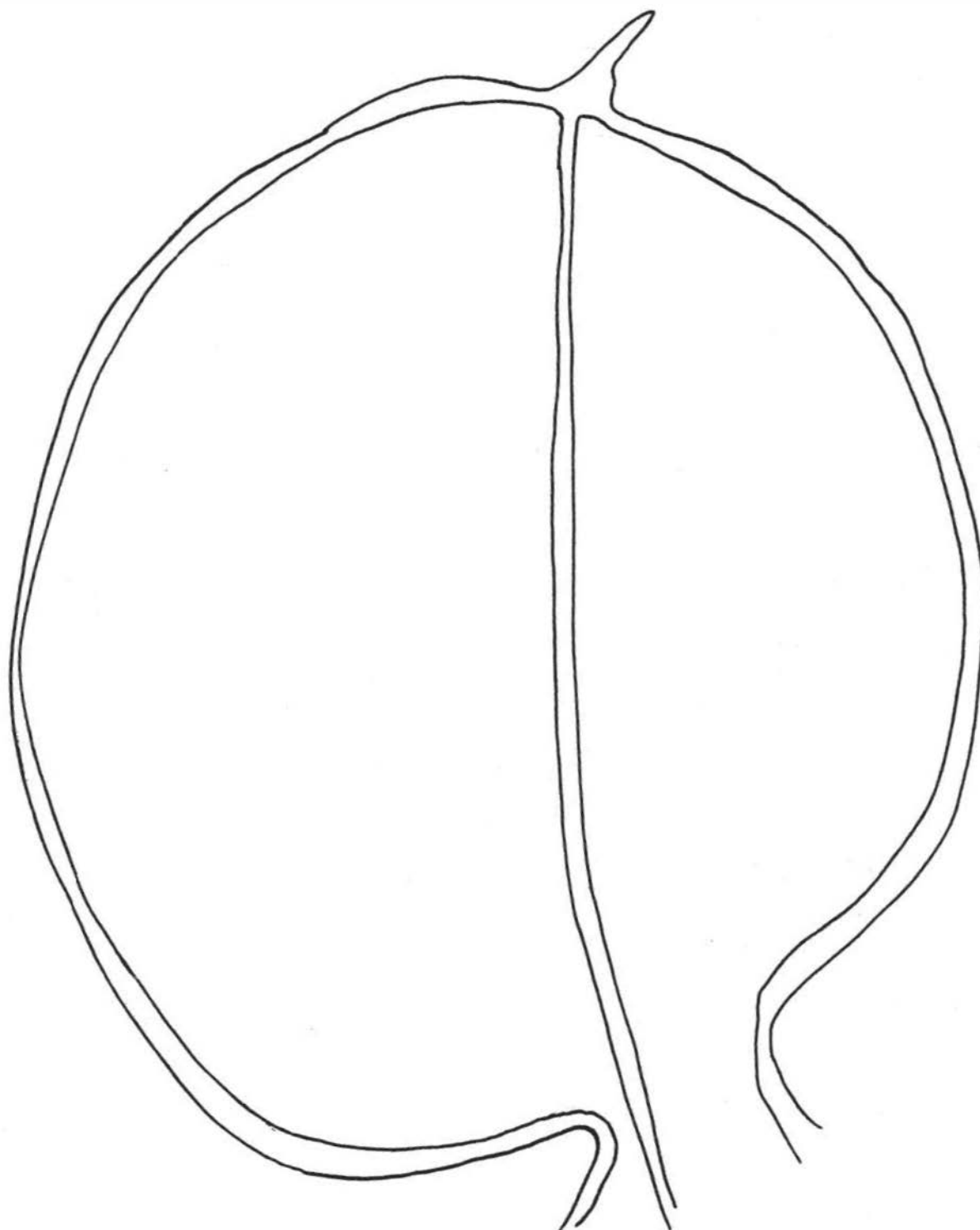


FIG. A

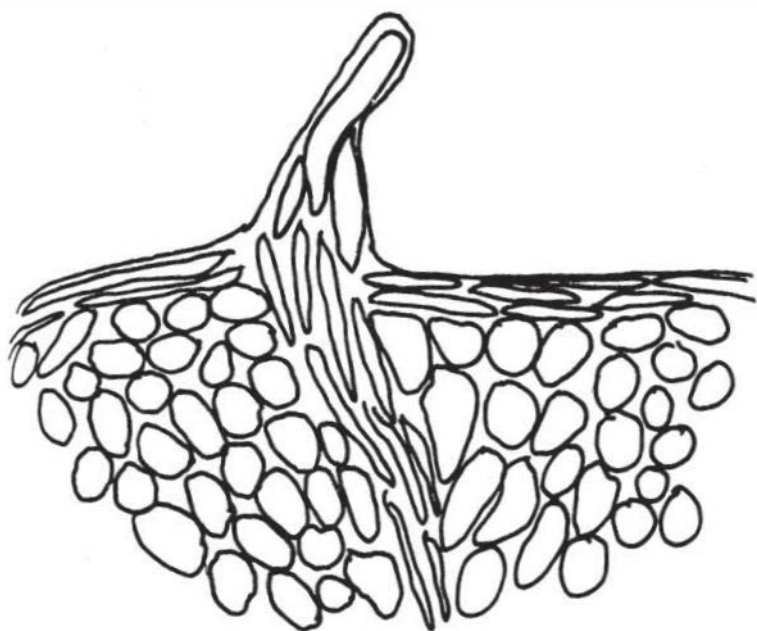


FIG. B

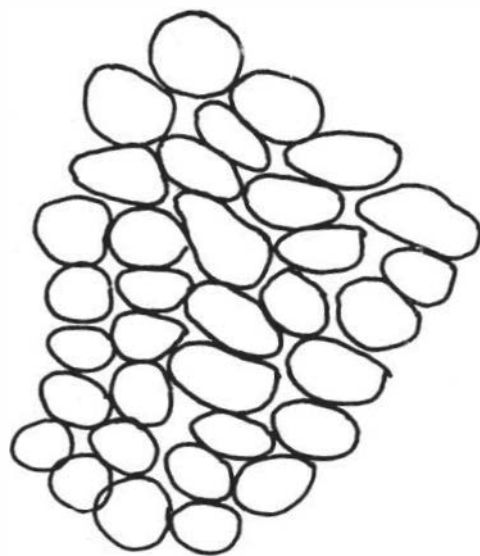


FIG. C

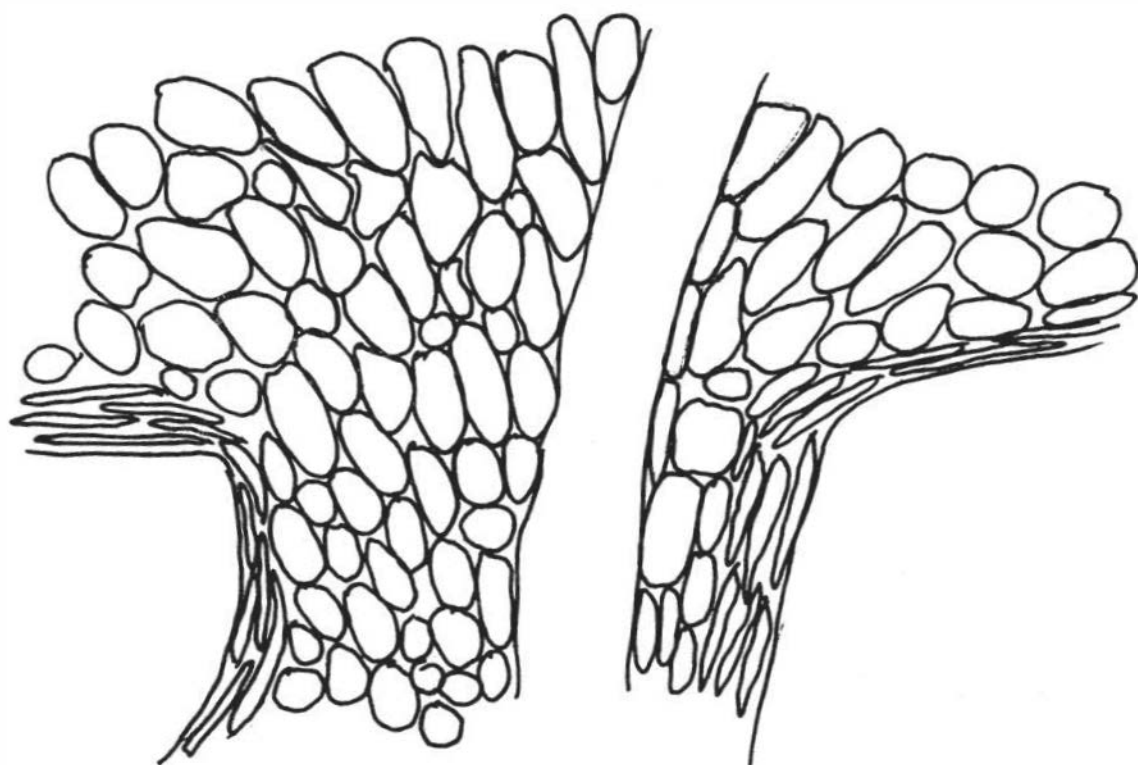


FIG. D

FAMILY: MNIACEAE

Mnium stellare Hedw.

Plants slender, in soft, loose tufts, green, stems erect, 1-3 cm. high, matted with brownish radicles below, branches basal; leaves slightly undulate, crispid, or twisted when dry, erect-spreading, small and distant below, larger and cells closer above, elliptic-ovate, 3-4 mm. long and 1.6-2 mm. wide, decurrent, costa reddish, ending abruptly at some distance below the tip of the leaf, apices rounded apex and acute, border absent, outer 1-2 rows of cells occasionally elongated, margins entire below, irregularly serrate above with short, broad, obtuse, 1-celled teeth; median cells, subhexagonal, 20-30 μ in diameter, with thickened corners; dioicous; calyptra cucullate, inconspicuous, fugacious; seta erect, reddish, 1.5-3.5 cm. high, single; capsule horizontal, brownish green, up to 4 mm. long, operculum convex, urn oblong, up to 3 mm. long, with short neck; annulus biseriate, deciduous, peristome double, teeth 16, yellowish, about 0.75 mm. long, papillose, inner peristome dark yellow, 22-32 μ in diameter, mature in May or June.

Habitat: On humus, ricks, base of trees, in shady and swampy woods.

Illinois distribution: Menard and Shelby Counties.

Mnium stellare Hedw.

Fig. A - Leaf - 40 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 160 X.

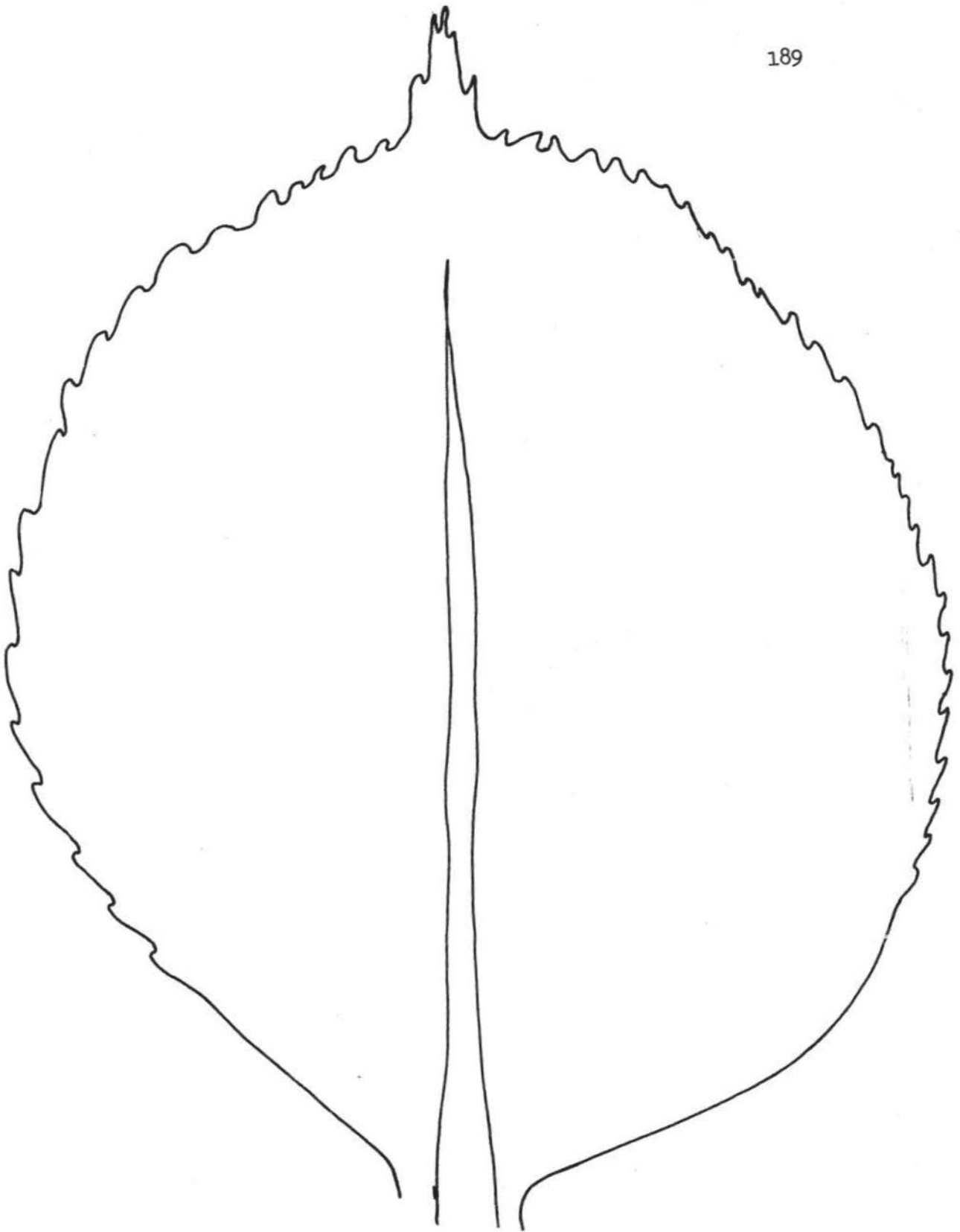


FIG. A

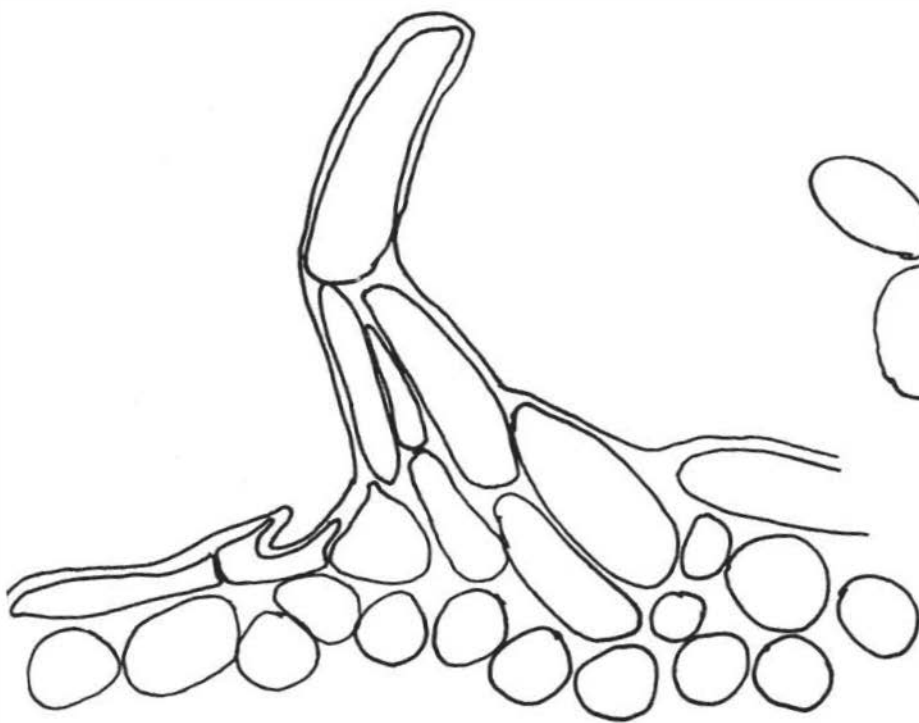


FIG. B

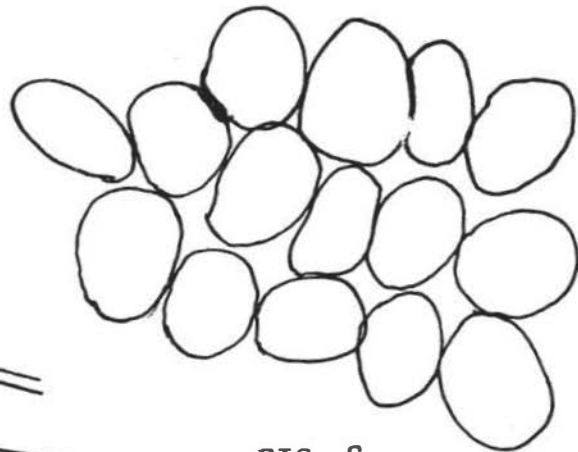


FIG. C

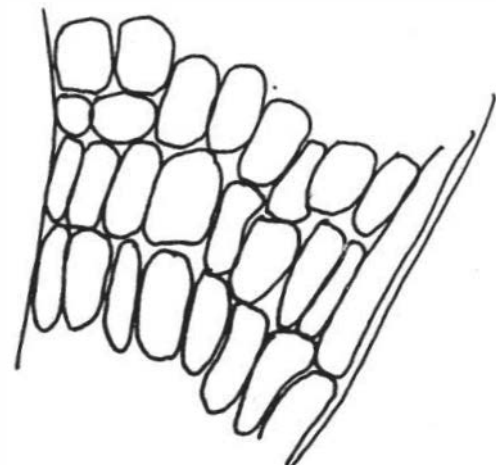
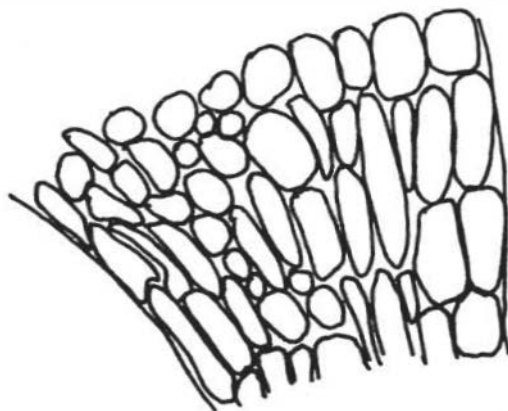


FIG. D

FAMILY: HYPNACEAE

Amblystegium juratzkanum Schimp.

Plants slender, bright green; stems prostrate, irregularly divided; branches ascending to erect, 1-1.5 cm. long; leaves widely spreading wet or dry, ovate to ovate-lanceolate, concave, up to 1.4 mm. long and 0.6 mm. wide, narrowed at base, decurrent, costate to slightly beyond the middle, apices long, slenderly and gradually acuminate, margins plane, almost entire to serrulate, median cells of leaves oblong to linear-rhomboidal or linear-hexagonal, approximately 60 μ long and about 10 μ wide, moderately incrassate, alar cells short oblong or rectangular, forming a distinct group; monoicous; calyptra small, conical, fugacious; seta castaneous, 15-30 mm. long; capsule yellow, light brown, reddish brown, cylindric, curved, and cernuous, 1.5-2 mm. long; operculum conic; urn unsymmetric, arcuate, contracted below mouth when dry and empty; annulus of 2-3 rows of cells; peristome perfect; hypnaceous, teeth 16, reddish, about 0.6 mm. long, strongly articulate and trabeculate, slightly united at base, hyaline margined, transversely striate, segments as long as teeth, reddish yellow, carinately, not split on keel or only slightly so, basal membrane 0.2 mm. high, cilia 1-3, approximate length of segments, nodose to shortly appendiculate; spores minutely papillose, 10-12 μ in diameter, mature in spring.

Habitat: On moist stones, soil, and rotten wood.

Illinois distribution: Clark, Cook, LaSalle, Pope, and Shelby Counties.

Amblystegium juratzkanum Schimp.

Fig. A - Leaf - 160 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

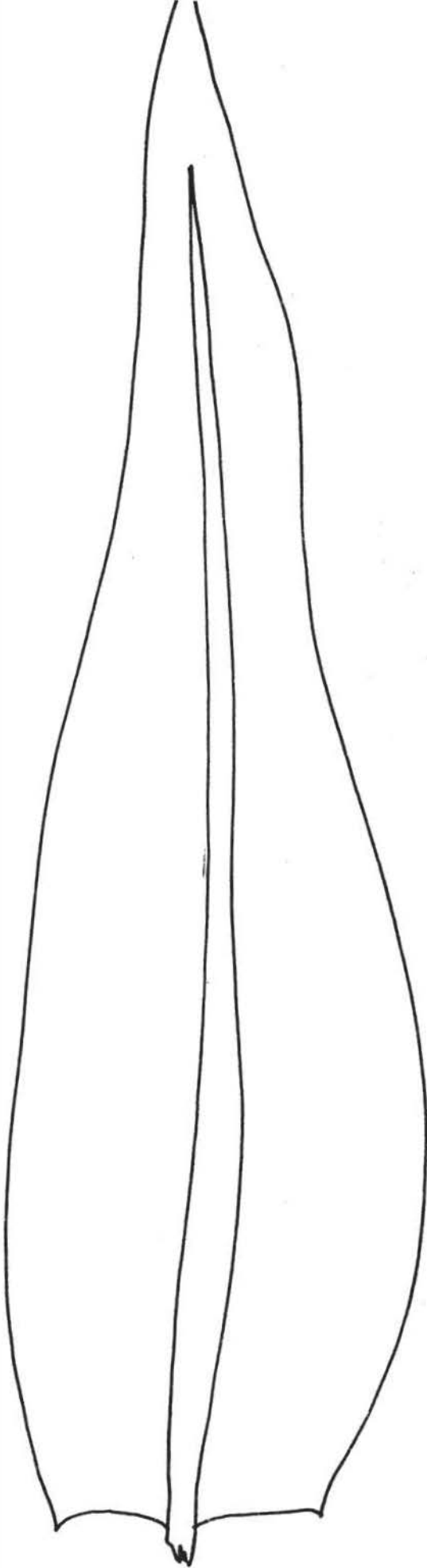


FIG. A

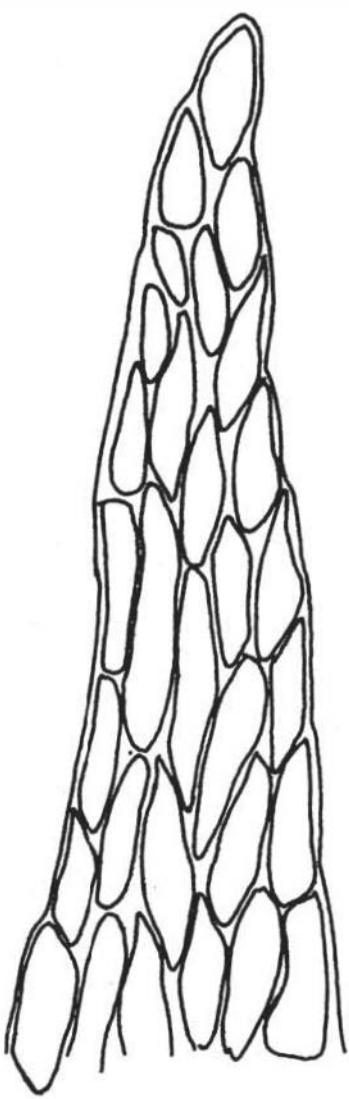


FIG. B

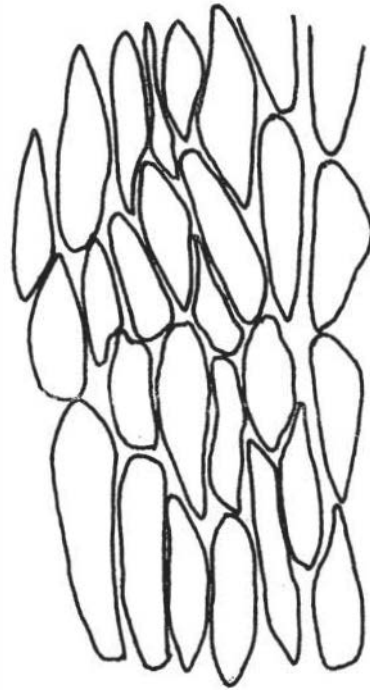


FIG. C

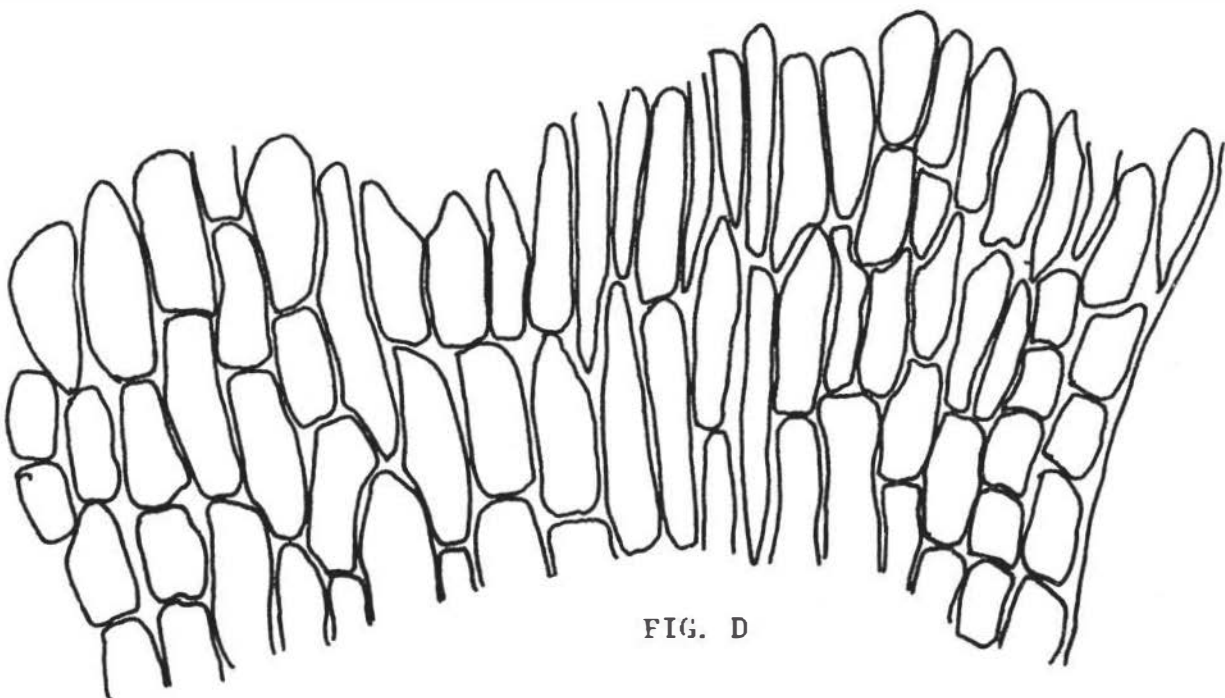


FIG. D

FAMILY: HYPNACEAE

Amblystegium serpens (Hedw.) B.S.G.

Plants slender, very small; stems prostrate, irregularly branching; leaves rather close, not widely spreading, ovate-lanceolate, subconcave, up to 1.2 mm. long and 0.5 mm. wide, commonly smaller, narrowed at insertion, slightly decurrent, costate to middle of leaf or slightly beyond, apices long tapering to a point, margins slightly serrate, marginal cells oblong-hexagonal, 30-35 μ long, marginal alar cells quadrate to elongate; calyptra small, conical, dull brown; seta 1-3 cm. long; capsule light brown, cernuous, cylindric, 1.5-2 mm. long; operculum convex, conical, apiculate, annulus of 2-3 rows of cells; peristome perfect; teeth pale brown, 16, trabeculate, transversely striate below, margin hyaline, segments about as long as teeth; urn strongly curved; spores papillose, 14-18 μ in diameter, mature in spring.

Habitat: On moist substrata, especially decaying wood.

Illinois distribution: Champaign, Clark, Coles, Cook, Effingham, Fulton, Henderson, Lake, Menard, Ogle, Peoria, Rock Island, Sangamon, and Shelby Counties.

Amblystegium serpens (Hedw.) B.S.G.

Fig. A - Leaf - 160 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

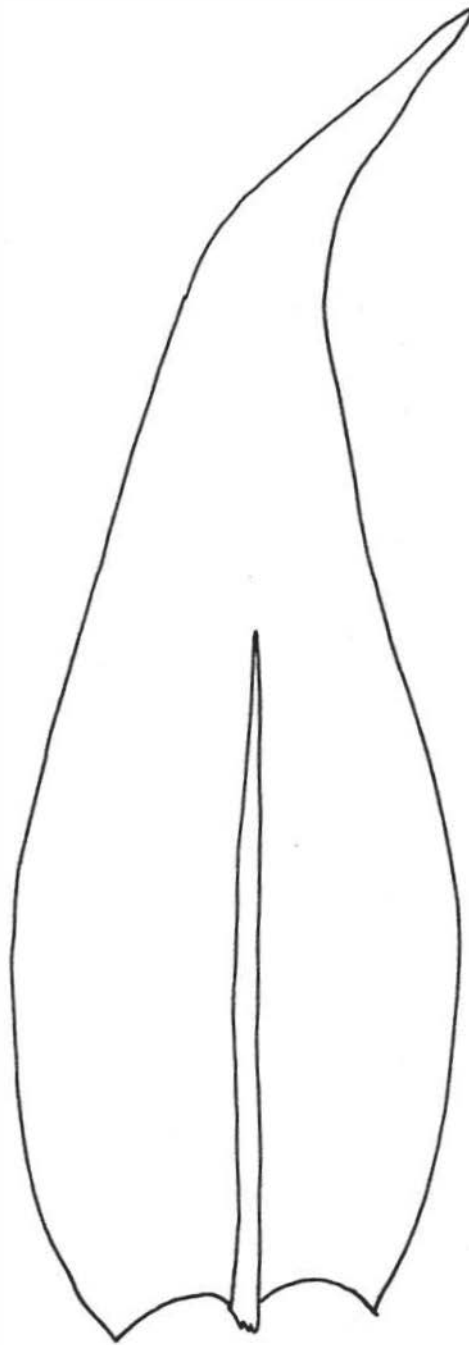


FIG. A

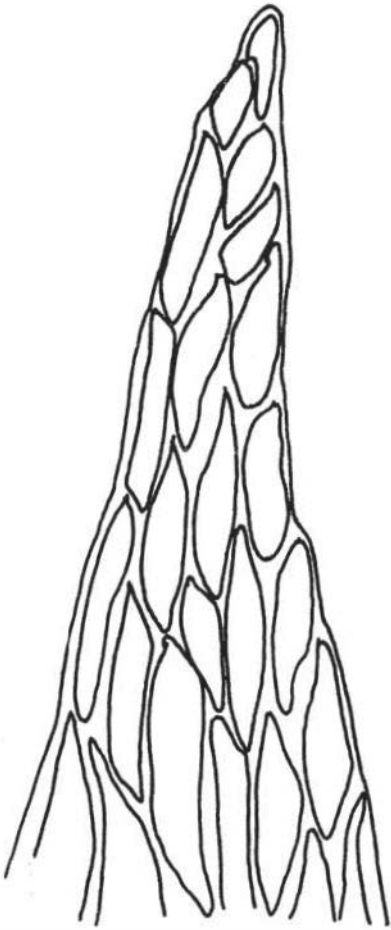


FIG. B

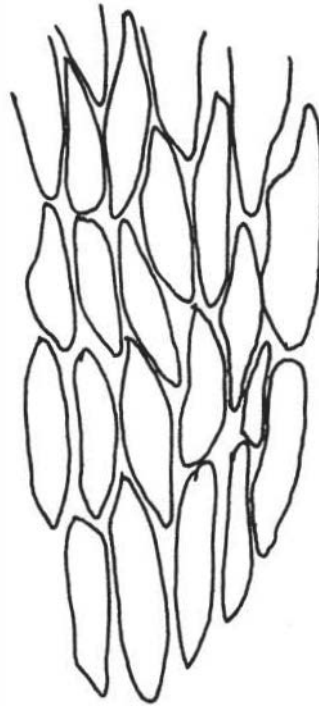


FIG. C

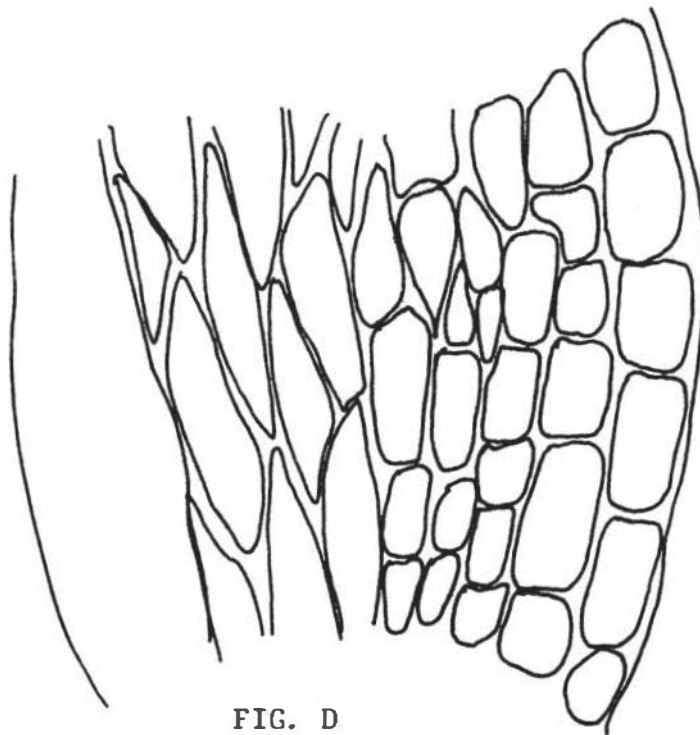


FIG. D

FAMILY: HYPNACEAE

Amblystegium varium (Hedw.) Lindb.

Plants light green in younger portions, darker with age; stems irregularly divided; leaves rather close, erect-spreading, broadly ovate to ovate-lanceolate, rapidly narrowed into acumen, slightly concave, usually 1.2 mm. long and 0.5 mm. wide, narrowed at insertion and slightly decurrent, costa strong, percurrent or nearly so, narrowing from base to apex, the apices long, margins entire, median cells of leaves rhomboidal-hexagonal, with ends somewhat rounded; alar cells frequently in rows parallel with leaf margin, alar cells rectangular; monoicous; seta 1-3 cm. long; capsule brownish, cernuous, 1.5-2 mm. long, annulus of 2-4 rows of cells, deciduous; peristome perfect, hypnaceous; teeth 16, united at base, about 0.4 mm. long, transversely striate below, hyaline and papillose above, trabeculate, segments as long as teeth, carinate, slightly split along keel, cilia 1-2; spores slightly papillose, 8-18 μ in diameter, mature in late spring.

Habitat: On moist, shaded substrata.

Illinois distribution: Carroll, Champaign, Clark, Coles, Cook, Effingham, Jackson, Lake, Ogle, Rock Island, Shelby, Union and Will Counties.

Amblystegium varium (Hedw.) B.S.G.

Fig. A - Leaf - 160 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 640 X.

Fig. D - Alar cells - 640 X.

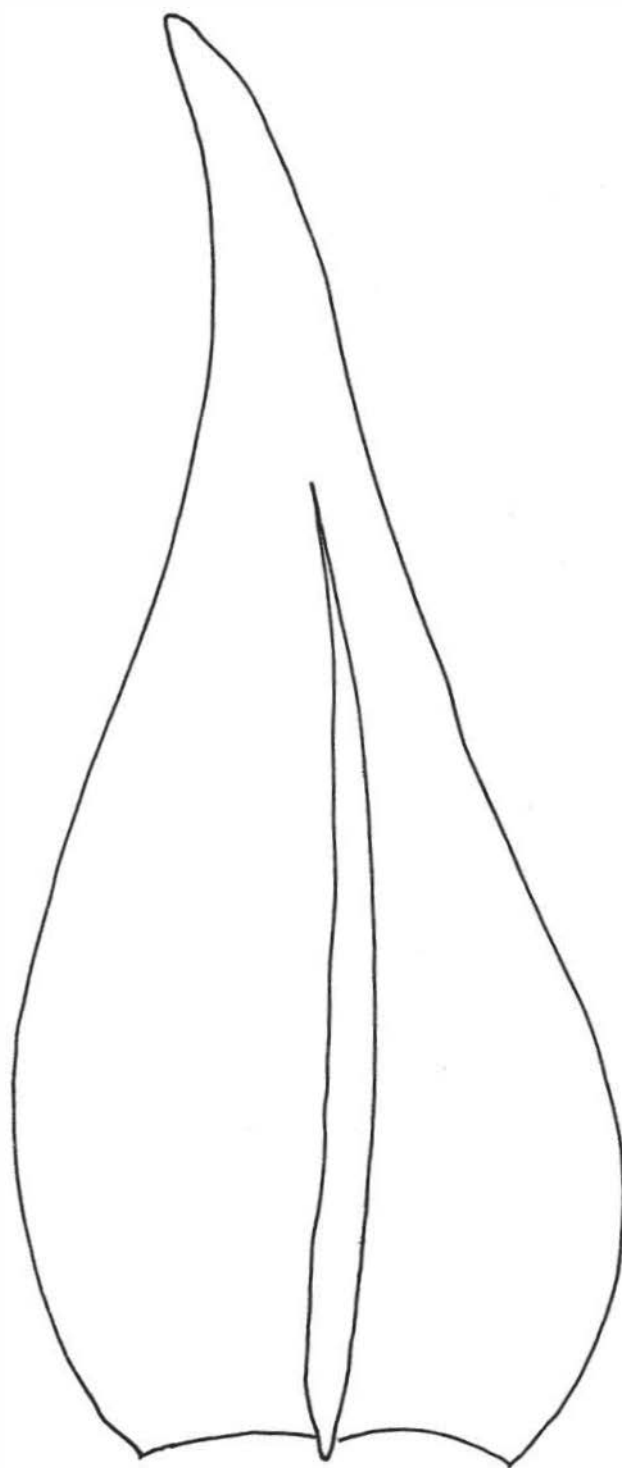


FIG. A

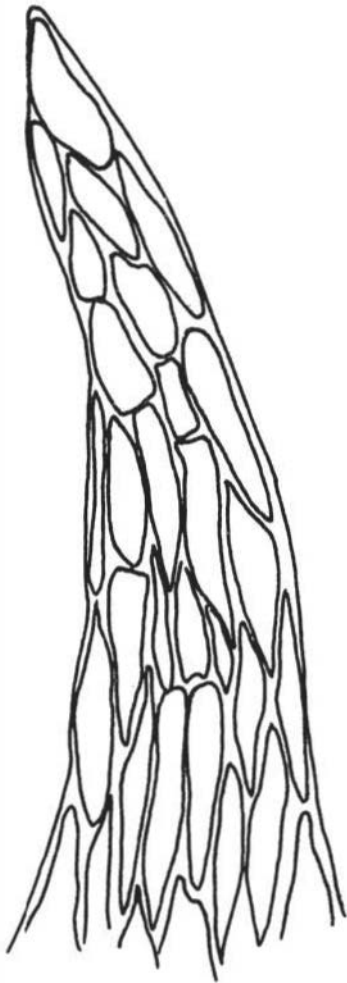


FIG. B

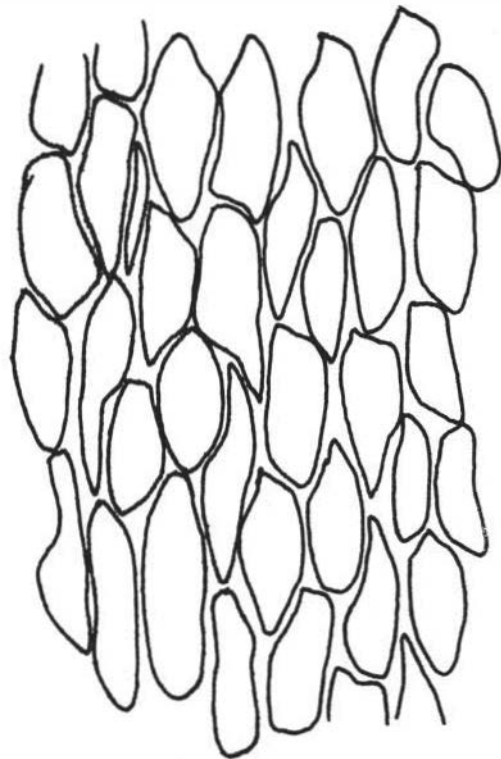


FIG. C

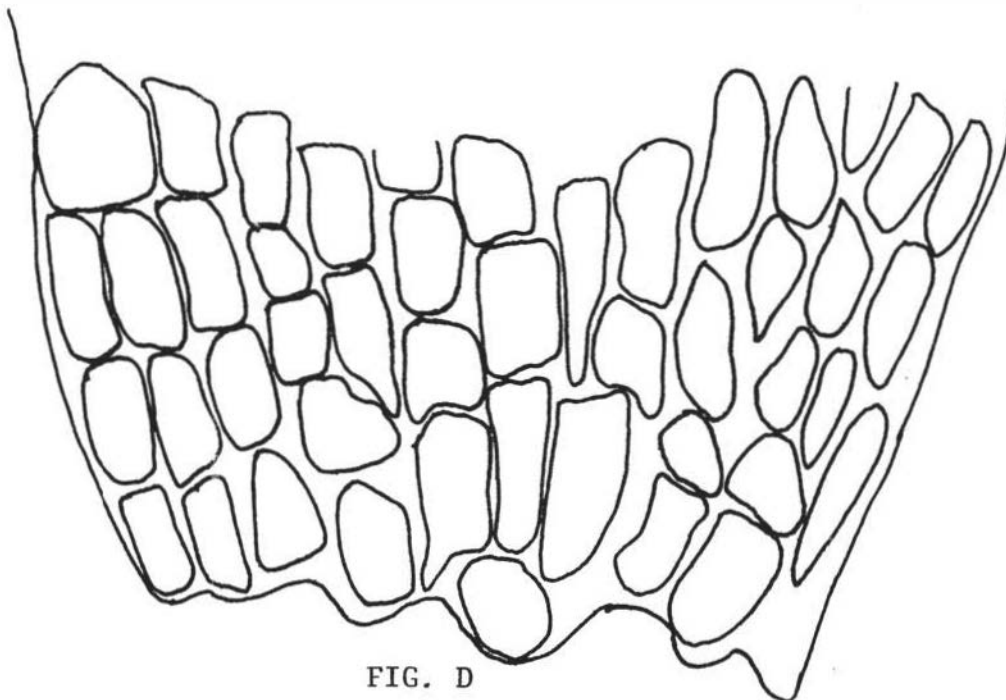


FIG. D

FAMILY: HYPNACEAE

Brachythecium campestre B.S.G.

Plants in wide yellow-green mats; robust, prostrate or ascending, up to 6 cm. or more in length, irregularly divided; leaves of branches equally spreading, sometimes slightly falcate-secund, ovate-lanceolate, concave, 1.4-2 mm. long, costa extending to middle of blade or beyond, apices long acuminate, margins strongly serrate above; median cells of leaf linear-flexuose, basal cells shorter and broader, alar cells quadrate; leaves of stems ovate-lanceolate, strongly plicate, about 2 mm. long, 0.6 - 1.1 mm. wide, apices long, subfiliform-acuminate; autoicous; calyptra narrowly cucullate, extending to middle of urn; fugacious; seta reddish brown, long, smooth at base and slightly rough above; capsule reddish brown, inclined to horizontal, 2.5 - 3 mm. long, operculum long conic, apiculate; urn oblong-ovoid, unsymmetrical, generally curved; annulus narrow; peristome hypnaceous, perfect; teeth 16; spores brownish, slightly papillose, 15-20 μ in diameter, mature in late fall or in winter.

Habitat: On soil, stones, roots, bases of trees, and rotten wood, in moist, shaded places.

Illinois distribution: Shelby County.

Brachythecium campestre B.S.G.

Fig. A - Leaf - 40 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

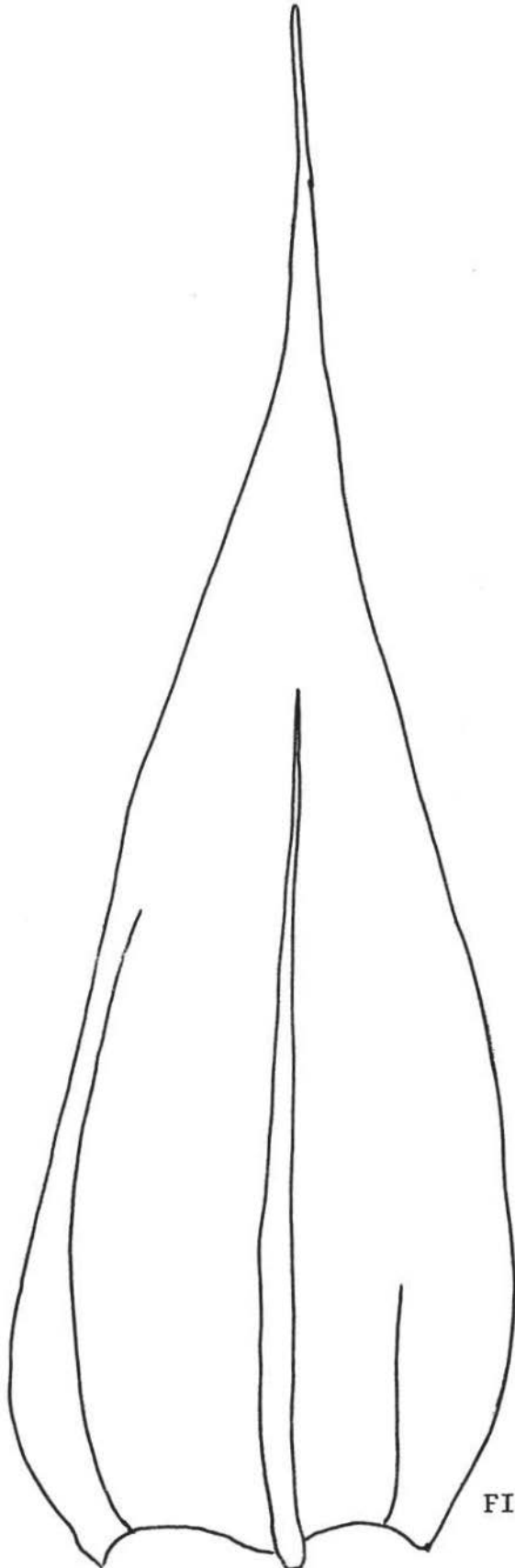


FIG. A

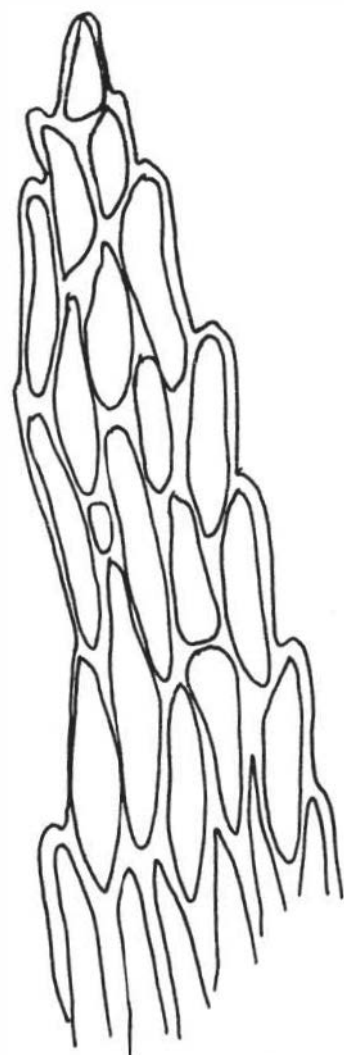


FIG. B



FIG. C

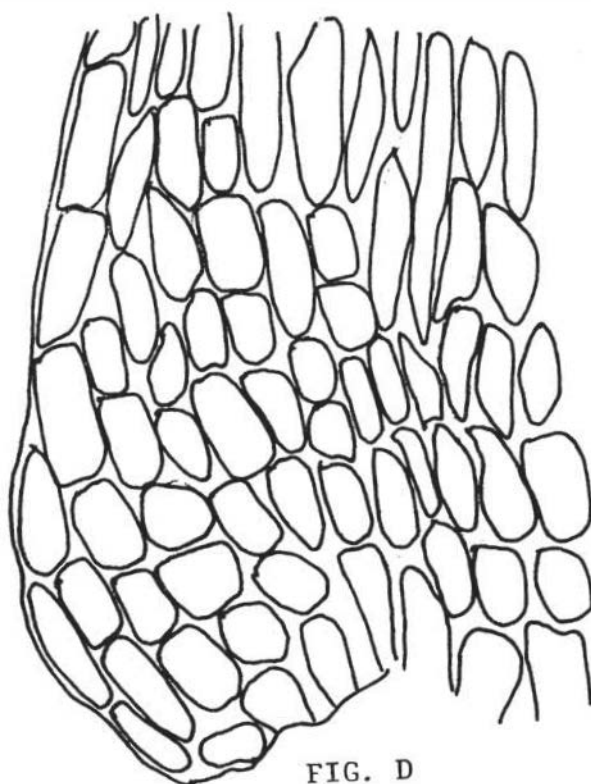


FIG. D

FAMILY: HYPNACEAE

Brachythecium oxycladon (Brid.) Jaeger and Sauerb.

Plants in wide mats, yellowish green, glossy; stems prostrate, regularly divided; branches erect, leaves close, loosely imbricate, erect-spreading, plicate, concave, alar portion decurrent, costa extending to middle of leaf or beyond, apices slenderly acuminate, leaves of stems ovate-lanceolate, 1.5-2 mm. long, 0.45-0.8 mm. wide, margins serrulate throughout, leaves of stems ovate, 2-2.5 mm. long, 0.9-1.2 mm. wide, margins serrulate, median cells of leaves narrowly linear, flexuose, basal cells shorter, broader, subquadrate to quadrate, alar cells numerous, small, quadrate, rather thick-walled; generally dioicous; calyptra narrowly cucullate, extending to middle of urn, fugacious; seta reddish brown, smooth, 1.5-2.5 cm. long; capsule reddish brown, sub-erect, often inclined when dry, 3-4 mm. long; operculum conic; urn oblong, subarcuate, slightly contracted below mouth when dry, neck gradually narrowed to seta, 2.5-3.5 mm. long; annulus none; peristome hypnaceous, perfect, teeth 16, light reddish brown, 0.65 mm. long, segments carinately split, cilia 2, basal membrane broad; spores finely papillose, about 15 μ in diameter, mature in autumn or winter.

Habitat: On soil, rocks, roots, on bases of trees in woods.

Illinois distribution: Clark, Coles, Cook, Fulton, Henderson, Johnson, Lake, LaSalle, Macon, Menard, Peoria, Rock Island, Sangamon, Shelby, and Will Counties.

Brachythecium oxycladon (Brid.) J.&S.

Fig. A - Leaf - 104 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

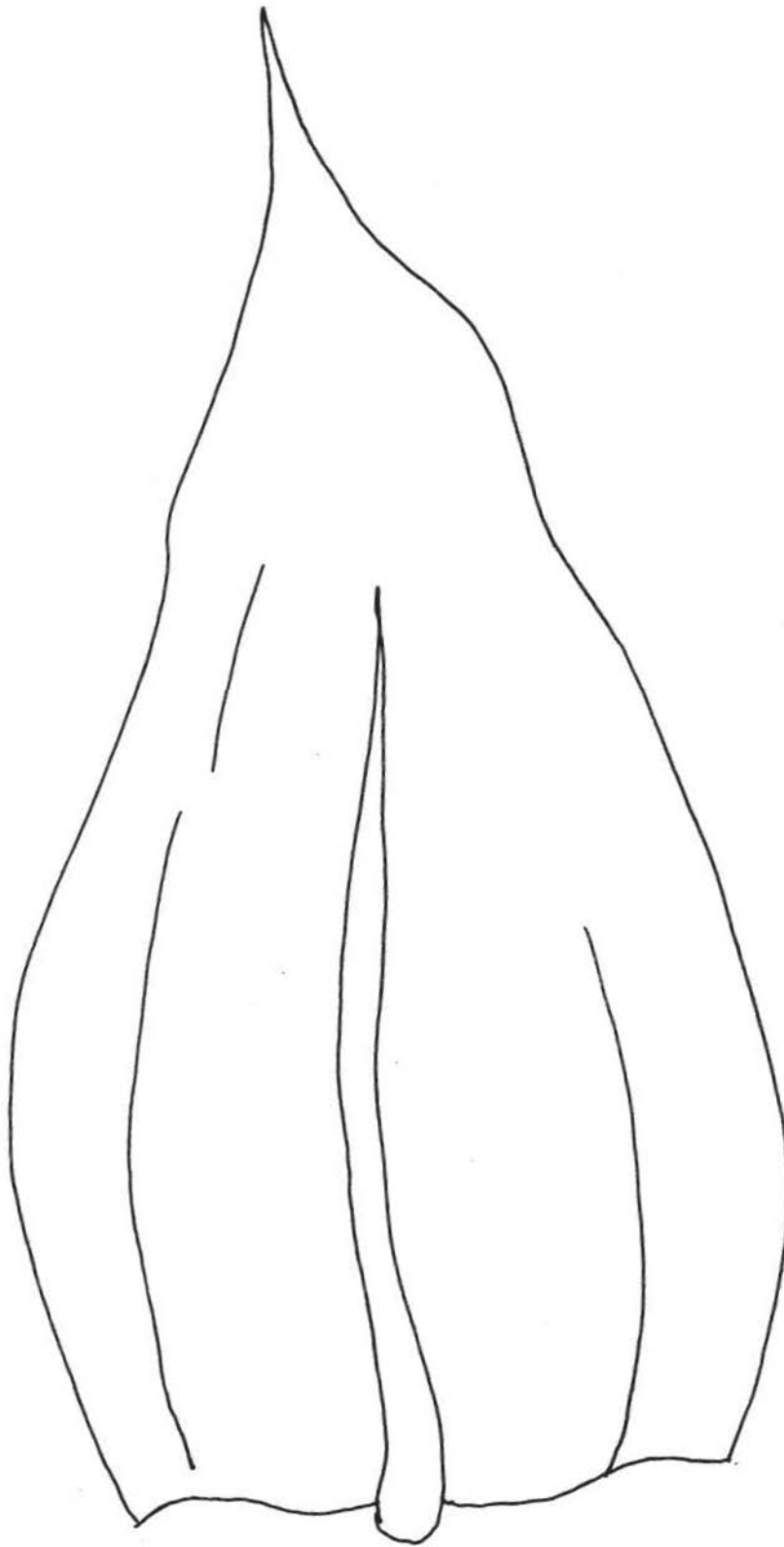


FIG. A

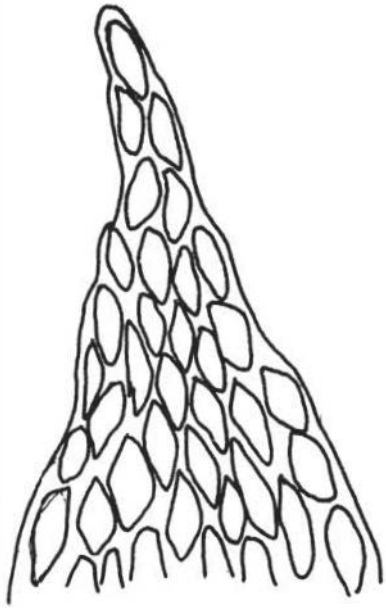


FIG. B



FIG. C

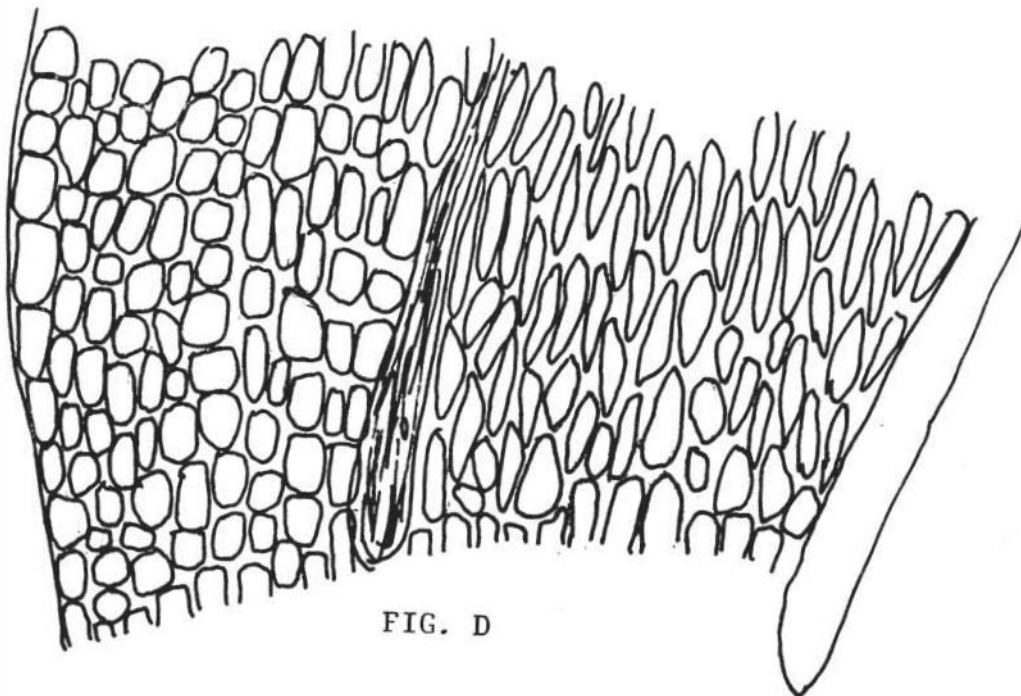


FIG. D

FAMILY: HYPNACEAE

Brachythecium salebrosum (Web. and Mohr.) B.S.G.

Plants in wide mats, dark yellow green, glossy, stems prostrate, 6 cm. or longer, irregularly divided, branches usually terete-foliate; leaves of branches erect-spreading, lanceolate, plicate, concave, 1.8-2.3 mm. long, 0.5-0.65 mm. wide, not decurrent, costa extending beyond middle of blade, apices abruptly acuminate, margins serrate above, entire to subserrulate below and reflexed, median cells linear, basal cells shorter, broader, usually 2-3 rows of large subquadrate cells, numerous, subquadrate with thin walls, leaves of stems erect-spreading, ovate lanceolate, concave, plicate, 1.5-2.2 mm. long, 0.6-1.1 mm. wide; autoicous, calyptra narrowly cucullate; seta reddish brown, smooth, 1.2 cm. long; capsule reddish brown, inclined to horizontal; operculum conic-apiculate to conic-acuminate, about 1 mm. long, annulus very narrow, conspicuous, often remaining attached to the operculum; peristome hypnaceous, perfect teeth, 16, prominently margined, 0.55-0.7 mm. long, segments about as long as teeth, split; spores brownish, slightly papillose to nearly smooth, 15-20 μ in diameter, mature in autumn or early winter.

Habitat: On soil, stumps, roots, and trunks of trees, and rotten wood, in moist, shady places.

Illinois distribution: Clark, Coles, Cook, Fulton, Lake, McDonough, Menard, Saline, Sangamon, Shelby, Union, and Will Counties.

Brachythecium salebrosum (W.&M.) B.S.G.

Fig. A - Leaf - 104 X.

Fig. B - Apical cells - 260 X.

Fig. C - Median cells - 260 X.

Fig. D - Alar cells - 260 X.

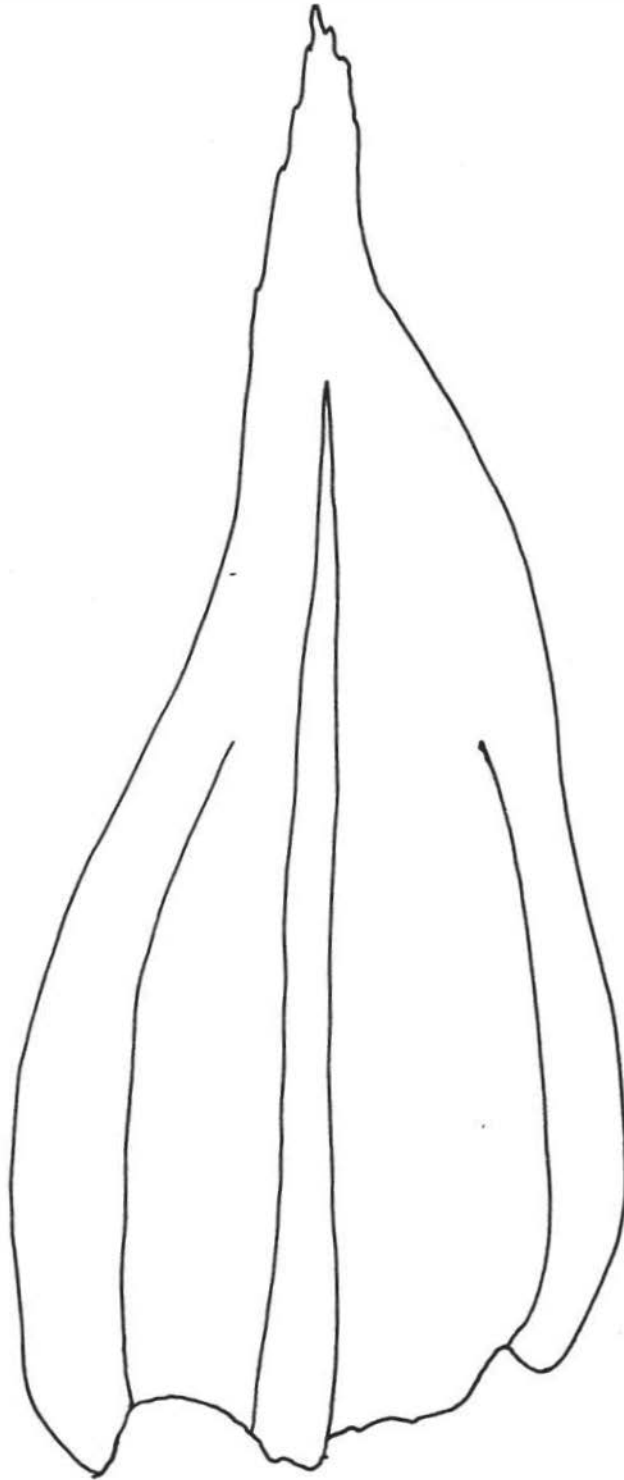


FIG. A

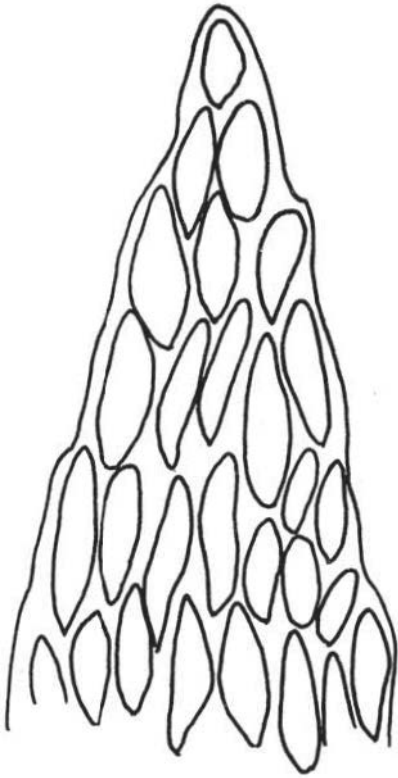


FIG. B

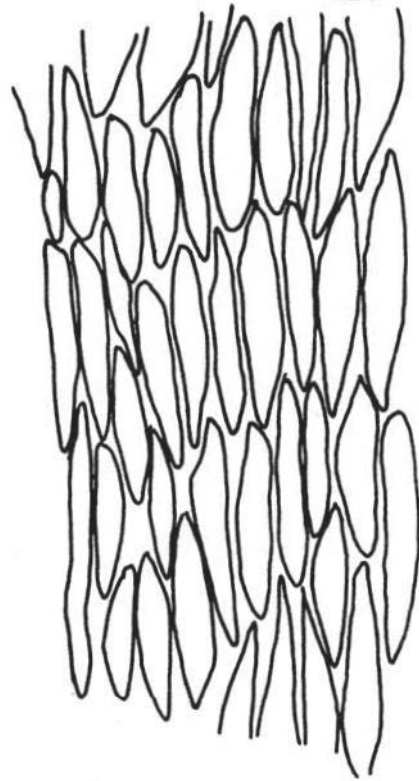


FIG. C

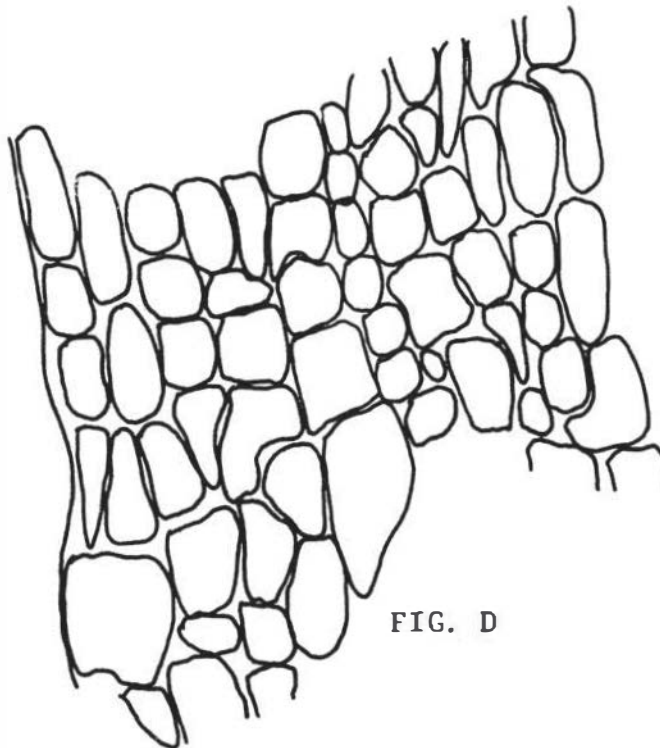


FIG. D

FAMILY: HYPNACEAE

Brotherella recurvans (Mx.) Fleisch.

Plants in mats, yellow green, very glossy; stems prostrate, reddish, irregularly pinnately divided; leaves close, imbricate at base, strongly complanately falcate-secund, turned downward; leaves of stems ovate-lanceolate, slightly concave, 1.2-1.5 mm. long, not decurrent, costa absent or short and double, apices slenderly long acuminate, margins often narrowly recurved below, sharply serrate above; median cells of leaves linear-flexuose, about 90 μ long, basal cells yellowish or brownish, shorter, wider, alar cells hyaline or colored, 4-8 very much enlarged and inflated, 3-4 along leaf margin and 3-4 transversely, the group bordered above by a few subquadrate, smaller cells; dioicous; calyptra cucullate, smooth, fugacious; seta chestnut-brown, glossy, 1-2 cm. long; capsule pale chestnut-brown, the tapering base darker, obliquely inclined to almost horizontal; operculum conic, long rostrate, approximately 1/2 length of urn; the urn oblong-oval, slightly curved when young, strongly arcuate with age, 1.5-2 mm. long; annulus absent; peristome hypnaceous, perfect, teeth 16, segments about as long as teeth, usually not carinately split, basal membrane about 2/5 height of teeth, cilia 1-2, slightly shorter than segments, subappendiculate; spores brownish, granulose, 16-18 μ in diameter, mature in late autumn.

Habitat: On soil, humus, bases of trees, and on decayed wood, moist shady places.

Illinois distribution: Clark, Coles, and Shelby Counties.

Brotherella recurvans (Mx.) Fleisch.

Fig. A - Leaf - 40 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

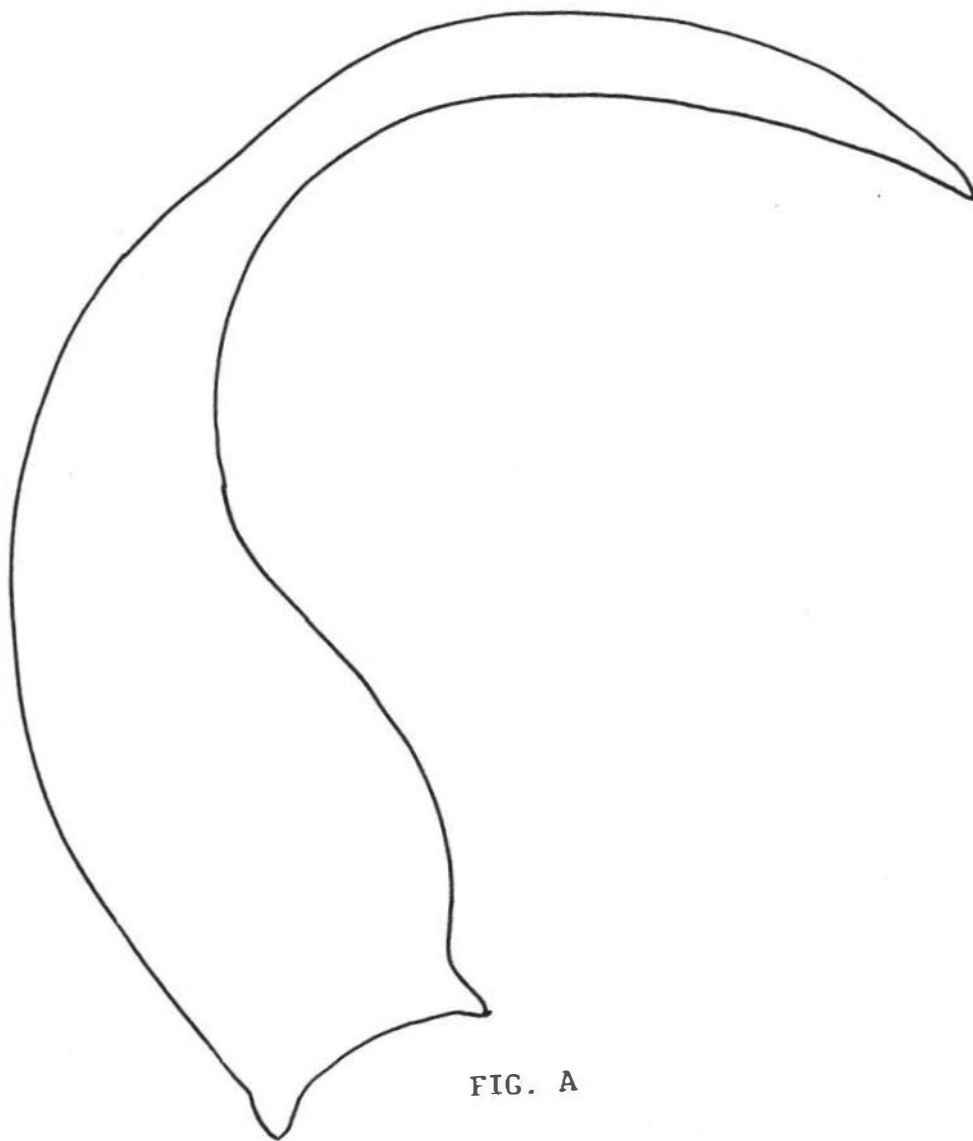


FIG. A



FIG. B

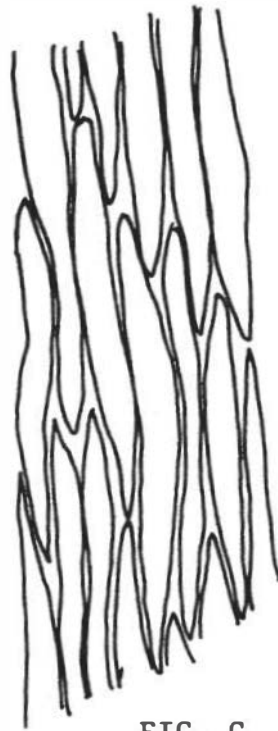


FIG. C

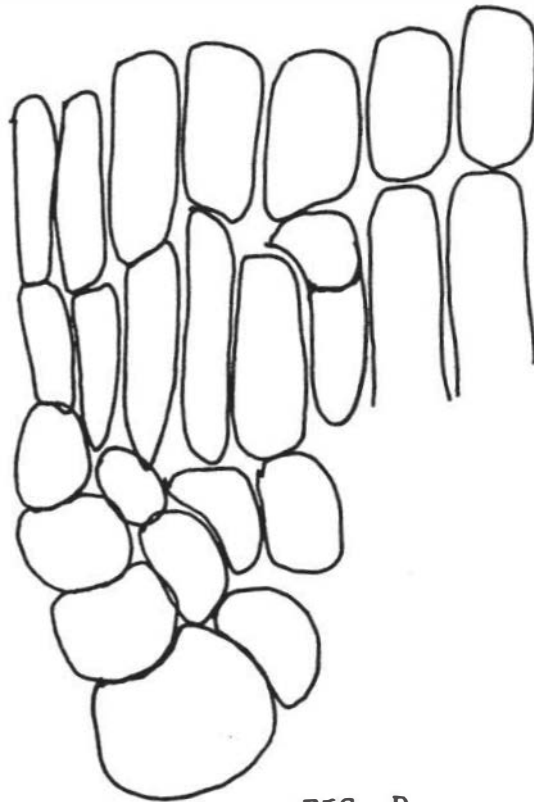


FIG. D

FAMILY: HYPNACEAE

Bryhnia graminicolor (Brid.) Grout

Plants slender in mats, yellowish green above, brownish below, stems prostrate, irregularly divided, 1-2.5 cm. long; branches erect, terete-foliate; leaves of branches loosely imbricate, ovate-lanceolate, concave, decurrent, costa extending past the middle of the leaf, apices long acuminate, lower surfaces of blade strongly papillose at distal end of cell, median cells of leaves linear, flexuose, alar cells few, subquadrate; leaves of stems larger and more slenderly acuminate, 0.75-1 mm. long, 0.4-0.5 mm. wide; dioicous; sporophytes not frequent; calyptra cucullate, smooth, fugaceous, seta reddish brown, 10-15 mm. long, rough, capsule reddish brown, inclined; operculum long conic to short rostrate, about 1/2 length of urn; urn subglobose to ovoid; annulus simple; peristome hypnaceous, perfect; teeth 16, confluent at base, inner peristome yellowish; spores nearly smooth, 13-15 μ in diameter, probably maturing in autumn.

Habitat: On soil, or rocks, in moist, shady places.

Illinois distribution: Clark, Coles, Fulton, Menard, and Shelby Counties.

Brhynia graminicolor (Brid.) Grout.

Fig. A - Leaf - 40 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

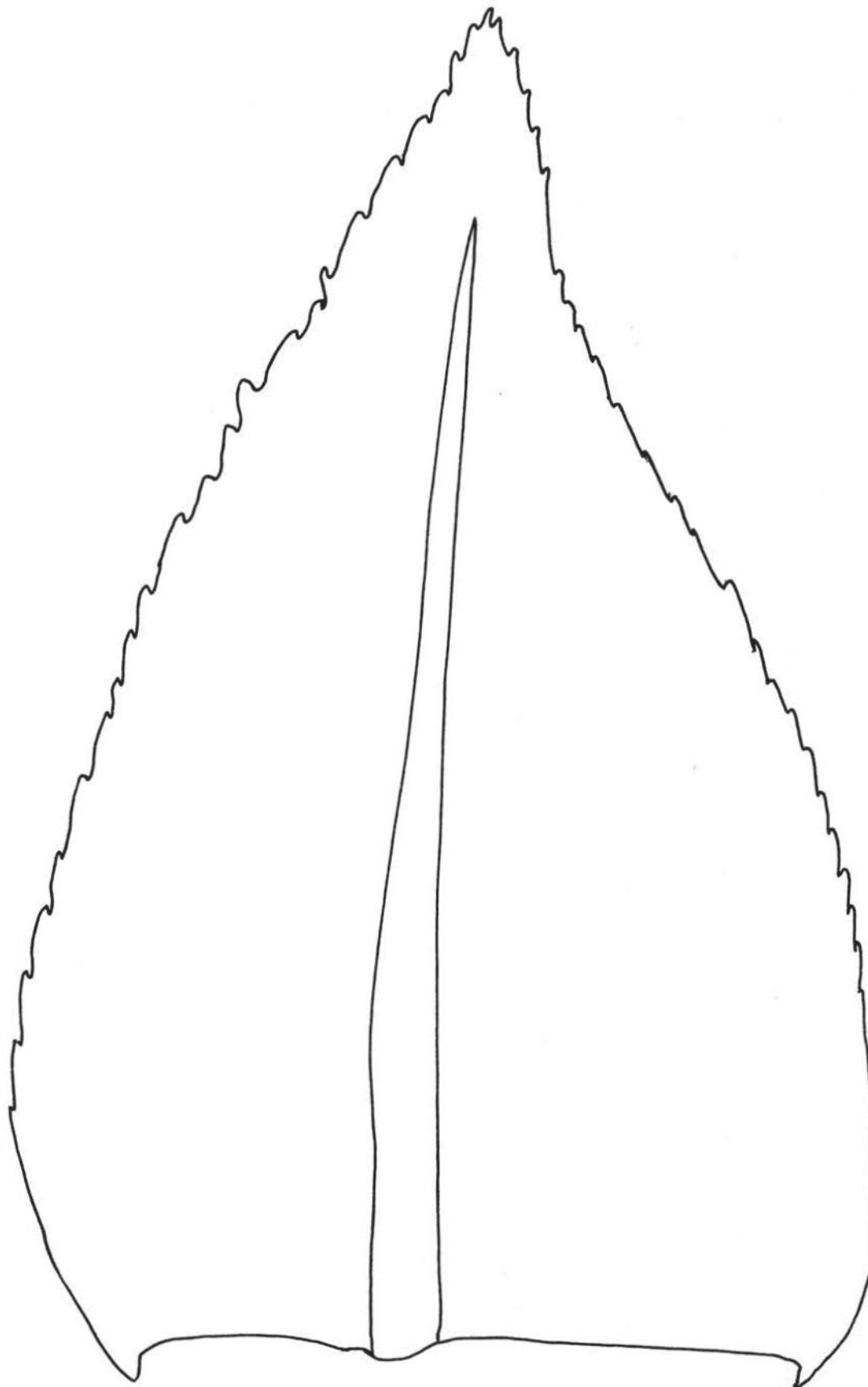


FIG. A

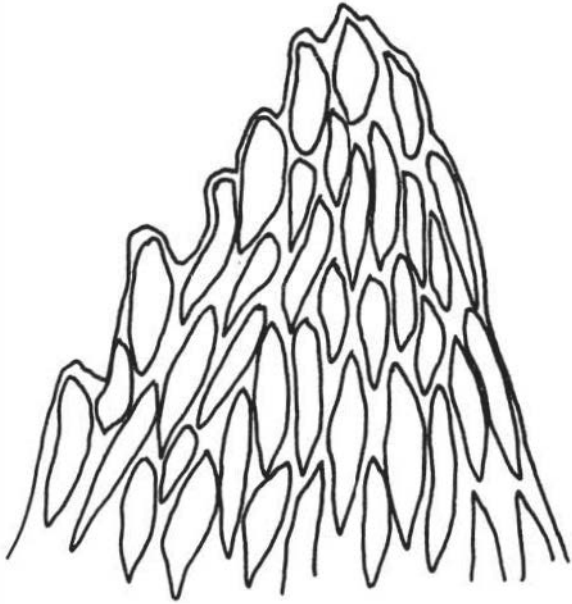


FIG. B



FIG. C

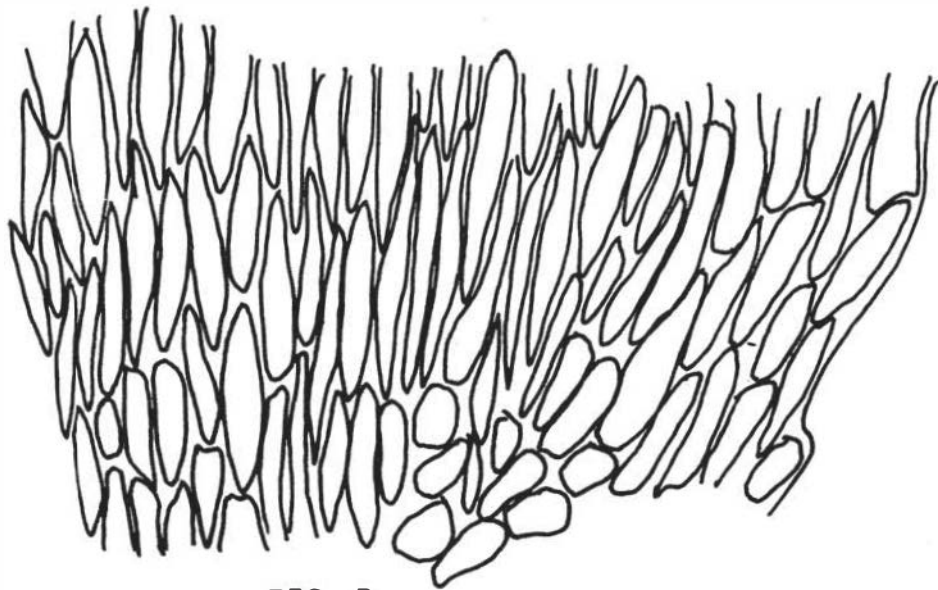


FIG. D

FAMILY: HYPNACEAE

Campylium hispidulum (Brid.) Mitt.

Plants in tufts, slender, bright green, yellowish below, stems prostrate, irregularly divided; leaves of stems widely spreading, triangular cordate, abruptly narrowed to acumen, slightly concave, 0.5-0.8 mm. long, excavate, decurrent, costa none, acumen slender, 1/3 to as long as the main body of the leaf, margins subserrulate throughout, more strongly serrulate at base; median cells of leaves prosenchymatous, elongate-oblong with blunt ends, 5-6 μ wide, basal cells shorter, wider, alar cells numerous, subrectangular to quadrate; leaves of branches similar, less broadly ovate, more gradually acuminate; autoicous; calyptra narrowly cucullate, smooth, fugacious; seta chestnut brown to yellowish; capsule cenuous, 1.4-2 mm. long, 0.75 mm. in diameter, yellowish brown, darker with age; operculum conic; urn oblong, curved or slightly so, 1.2-1.4 mm. long, contracted beneath mouth and furrowed when dry and empty; peristome hypnaceous, perfect, teeth 16, yellowish, inner peristome yellowish, segments split, nodose; spores yellowish, 10-14 μ in diameter, mature in late spring or summer.

Habitat: On roots and bases of trees, decaying wood, and humus, in moist shaded places.

Illinois distribution: Champaign, Clark, Coles, Cook, Effingham, Lake, McDonough, McLean, Menard, and Shelby Counties.

Campylium hispidulum (Brid.) Mitt.

Fig. A - Leaf - 160 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 640 X.

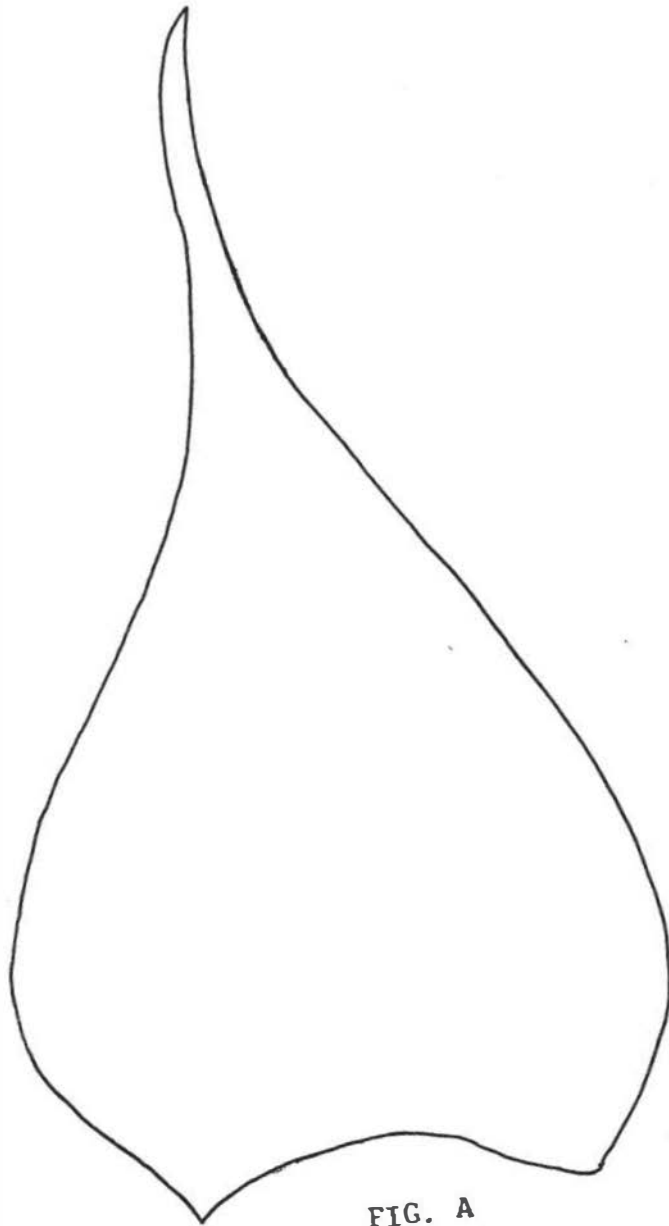


FIG. A



FIG. B

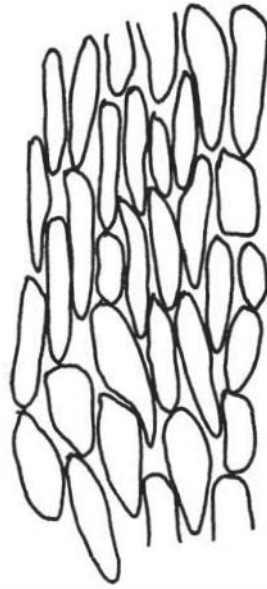
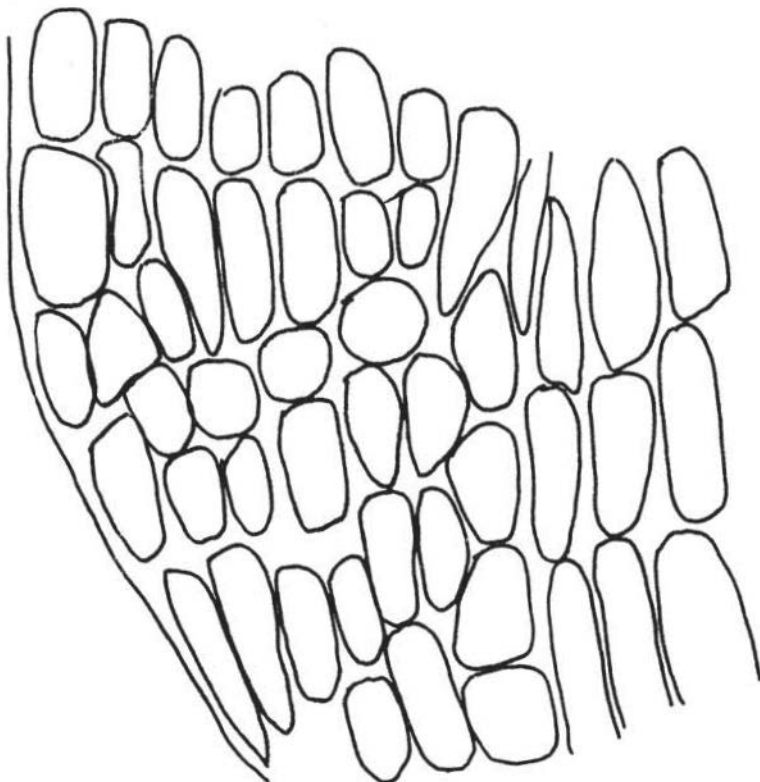


FIG. C



FAMILY: HYPNACEAE

Chamberlainia acuminata (Hedw.) Grout

Plants slender, in wide mats, green, dark green, yellowish green; stems prostrate, up to 8 cm. in length, distantly and irregularly divided; branches unequal, ascending to erect, terete-foliate, subjulaceous, tapering to acute ends, 1-3 cm. long; leaves of branches erect-spreading when moist, erect-imbricate and appressed when dry, lanceolate to ovate-lanceolate, concave, slightly plicate, 1-1.6 mm. long, 0.4-0.6 mm. wide, bases narrowed, slightly decurrent, costa extending to middle of blade, apices acuminate, margins frequently slightly revolute, entire below, subserrulate to serrulate above; leaves of stems similar, sometimes broader, ovate to ovate-lanceolate; median cells of leaves linear-flexuose to oblong-rhomboidal, basal cells enlarged, subquadrate to subrectangular, thin-walled, a distinct area extending from margin to costa; dioicous; calyptra glabrous, narrowly cucullate, extending to middle of urn; fugacious; seta reddish brown, smooth, 1-2 cm. high; capsule chestnut-brown, erect, 1.5-3 mm. long; operculum conic, acute to short rostrate; urn cylindric, usually symmetric, occasionally slightly curved, tapering at base, 1.5-3 mm. long; annulus none; peristome hypnaceous, teeth 16, chestnut-brown, confluent at base, segments narrow, carinately split, about length of teeth, basal membrane about 1/4 height of segments, cilia very rudimentary or none; spores chestnut-brown, papillose, 12-18 μ in diameter, mature in autumn or winter.

Habitat: On soil, rock, bases of trees, decaying wood, and humus, in moist, shady places.

Illinois distribution: Clark, Coles, Fulton, Menard, and Shelby Counties.

Chamberlainia acuminata (Hedw.) Grout

Fig. A - Leaf - 40 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

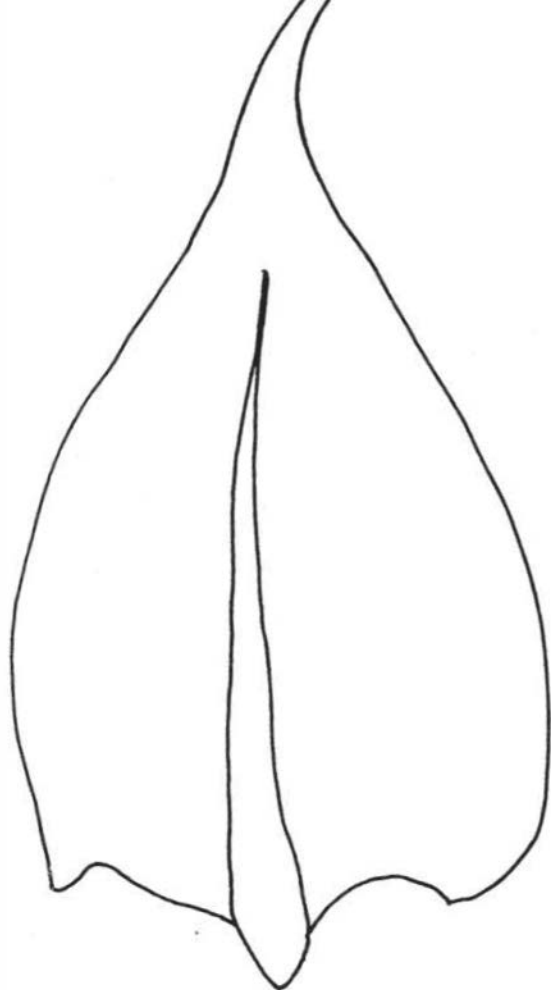


FIG. A



FIG. B



FIG. C

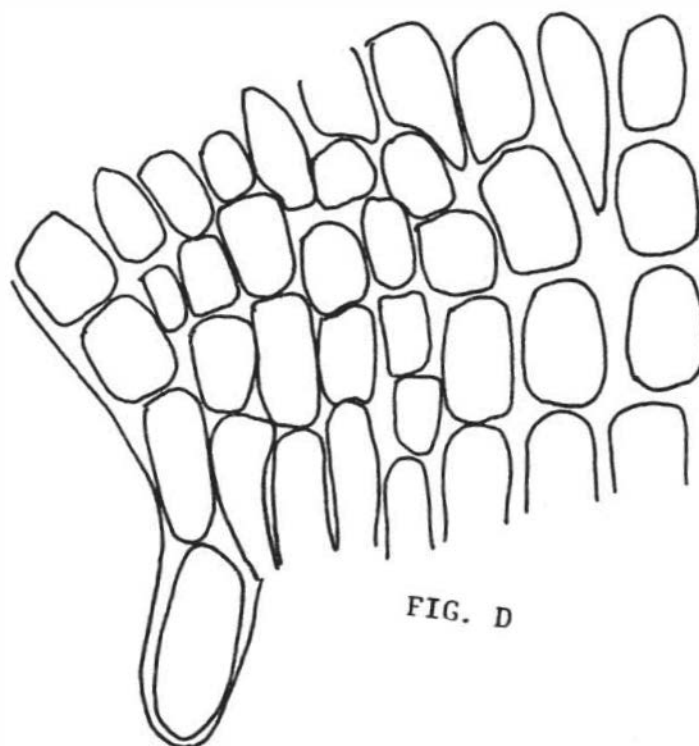


FIG. D

FAMILY: HYPNACEAE

Cirriphyllum boscii (Schwaegr.) Grout

Plants in mats; golden green; stems 8-10 cm. long, often with stolons; branch leaves erect-spreading when moist, loosely imbricate when dry, broadly ovate, spoon-shaped, very concave, 2-2.5 mm. long, 1.4-1.5 mm. wide, bases decurrent with angles subauriculate, costa single and extending 1/2 length of blade, apices rounded and abruptly acuminate, the acumination filiform and twisted one-half turn, margins serrate to the middle; median leaf cells narrowly linear-rhomboidal, basal cells shorter, alar cells not differentiated; dioicous; calyptra narrowly cucullate, smooth, fugacious; seta reddish brown, smooth, 1.5-3 cm. long; capsule brown, inclined, unsymmetric, gradually narrowing into the seta, 3-4 mm. long; operculum conic, long rostrate, about 1/2 length of urn; the urn oblong, about 2 mm. long and 1 mm. in diameter, contracted beneath mouth when dry and empty; annulus of 2 rows of cells; peristome hypnaceous, perfect, teeth 16; spores nearly smooth, about 16 μ in diameter, mature in autumn.

Habitat: On soil and rocks, in moist woods and in fields.

Illinois distribution: Clark, Coles, Cook, Johnson, LaSalle, Menard, Peoria, Pope, Shelby, and Union Counties.

Cirriphyllium boscii (Schwaegr.) Grout

Fig. A ~ Leaf ~ 26.5 X.

Fig. B - Apical cells - 160 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

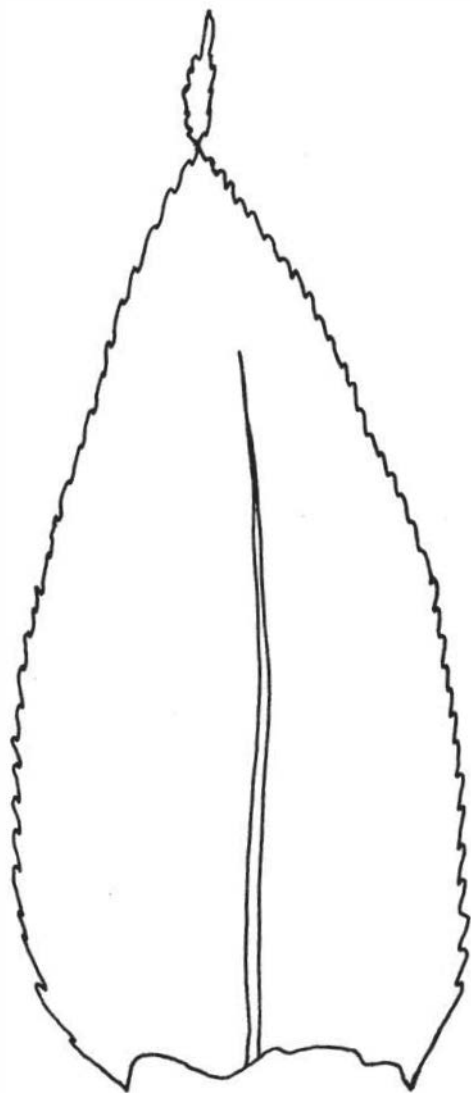


FIG. A

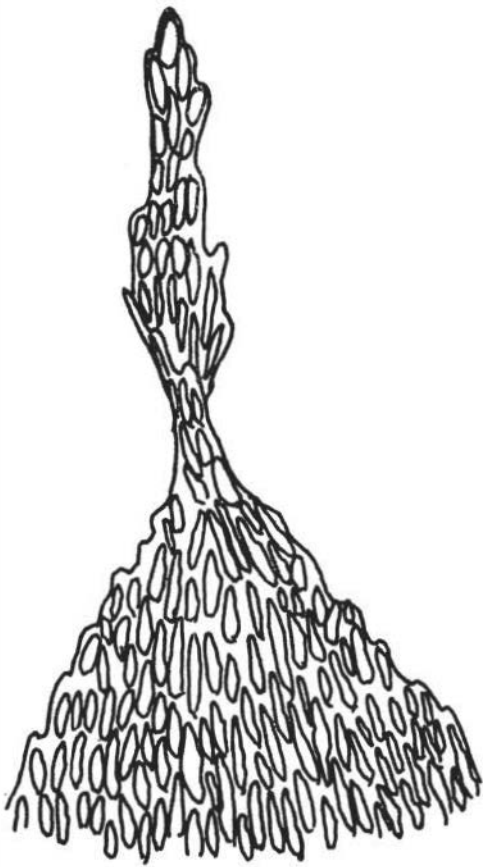


FIG. B

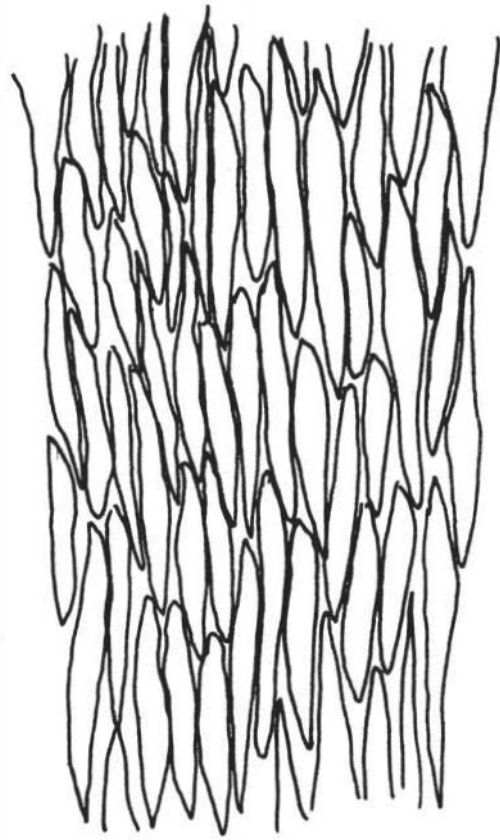


FIG. C

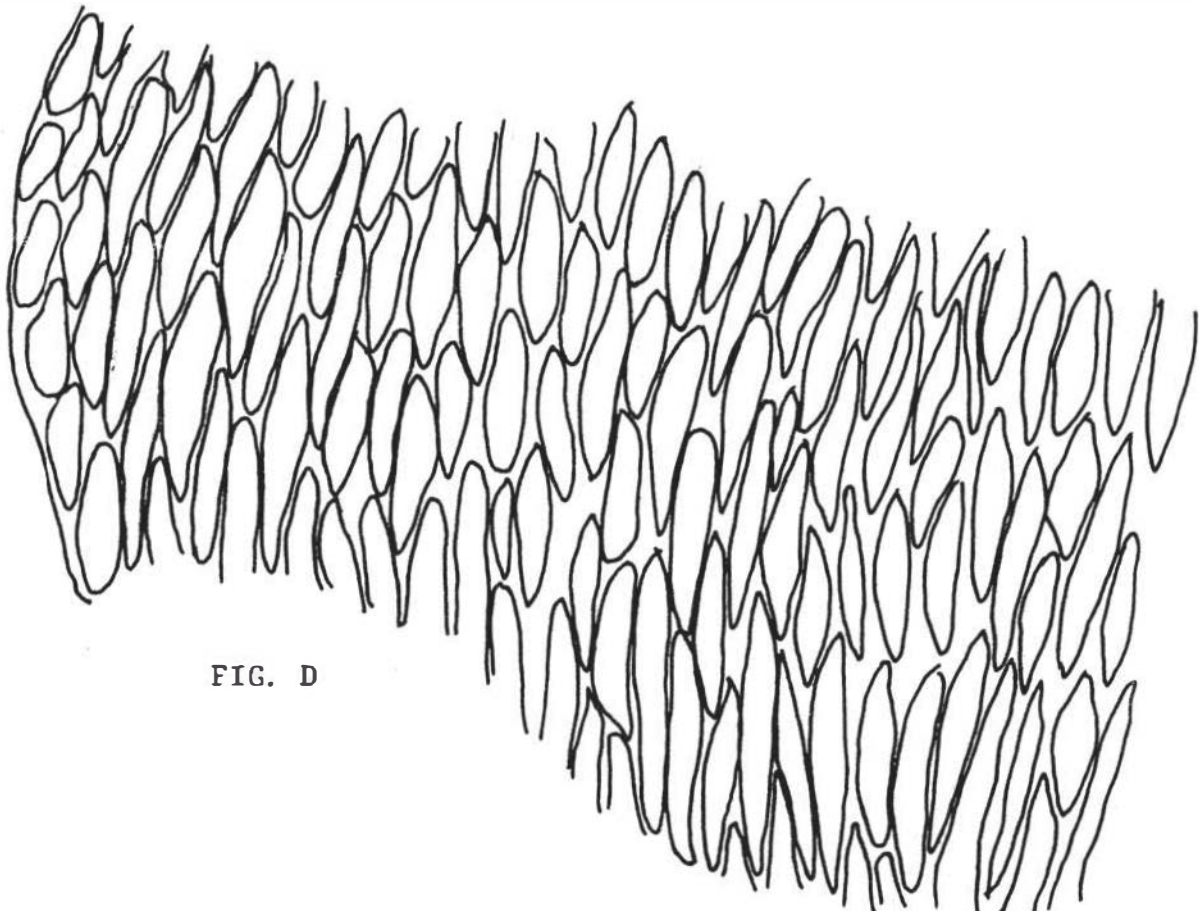


FIG. D

FAMILY: HYPNACEAE

Climacium americanum Web. and Mohr.

Plants robust, loosely caespitose, yellowish green, glossy, primary stems prostrate, secondary stems erect, 5-8 cm. high. irregularly divided into a cluster of spreading foliated, terete branches, 1.5-2.4 cm. long, tips acute; paraphyllia present, conspicuous on branches and secondary stems; erect-spreading when moist, broadly lanceolate, upper leaves ovate-lanceolate, bases broad, costa nearly to apex, apices acute, margins denticulate below, sharply serrulate above; median cells of leaves oblong-hexagonal, ends rounded, alar cells quadrate along margin to diamond-shaped elsewhere; apical and upper marginal cells larger than median and rhombic-oblong; dioicous; calyptra enclosing capsule, cleft on one side to apex; seta erect, chestnut brown, cylindric 5-6 mm. long; operculum conic, about 1 mm. long; urn nearly smooth, slightly contracted below mouth when dry and empty; annulus none; peristome double, teeth orange, 16, slender, segments yellowish, longer than teeth, granular-papillose, basal membrane very narrow; spores yellowish, minutely roughened, 16-18 μ in diameter, mature in autumn.

Habitat: On rotten logs, stumps, wet soil, and rocks; in damp, shady woods, and in stumps.

Illinois distribution: Carroll, Champaign, Clark, Coles, Cook, Fulton, Henderson, Jackson, Johnson, Lake, LaSalle, Menard, Peoria, Pope, Rock Island, and Shelby Counties.

Climacium americanum Brid.

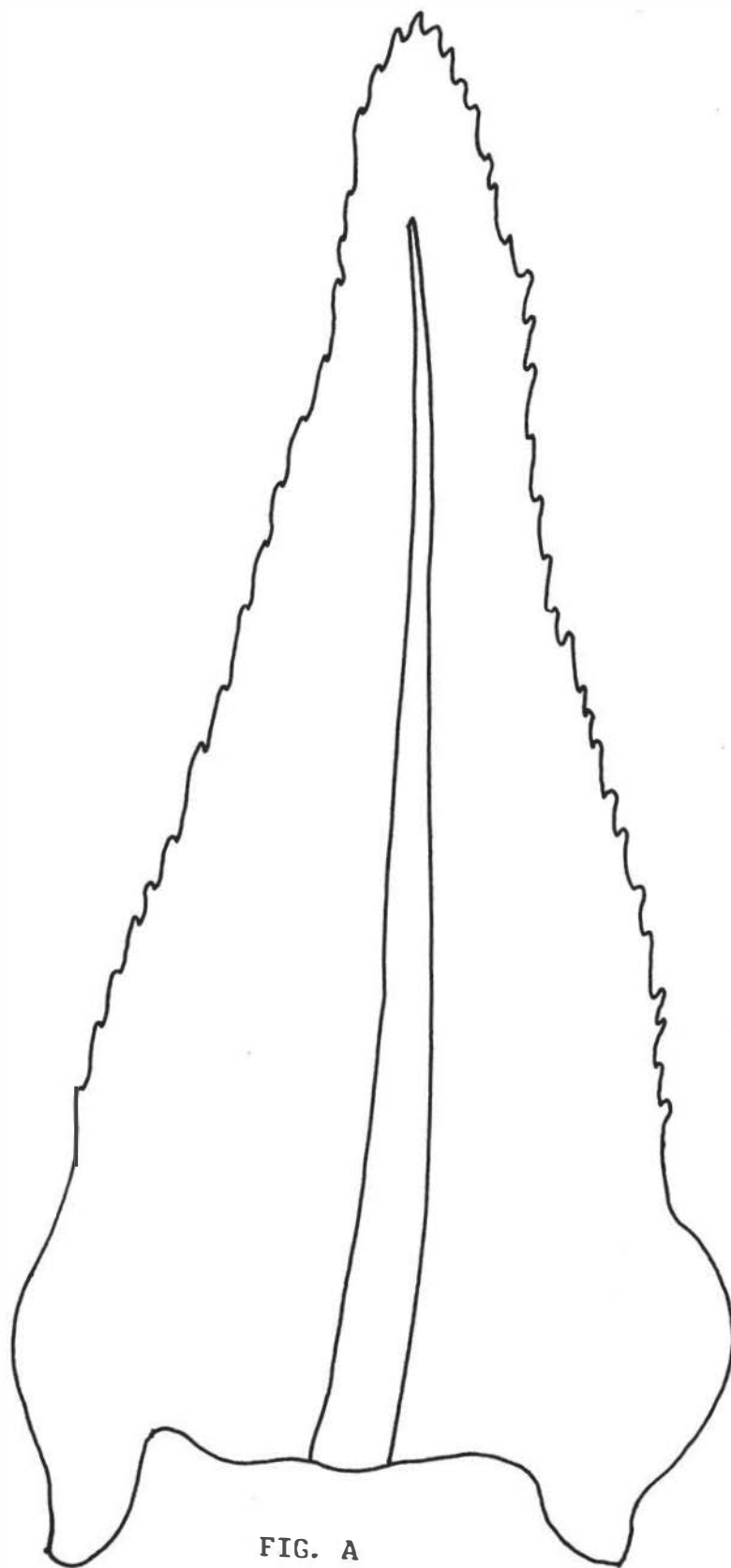
Fig. A - Leaf - 40 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

Fig. E - Auricle cells - 400 X.



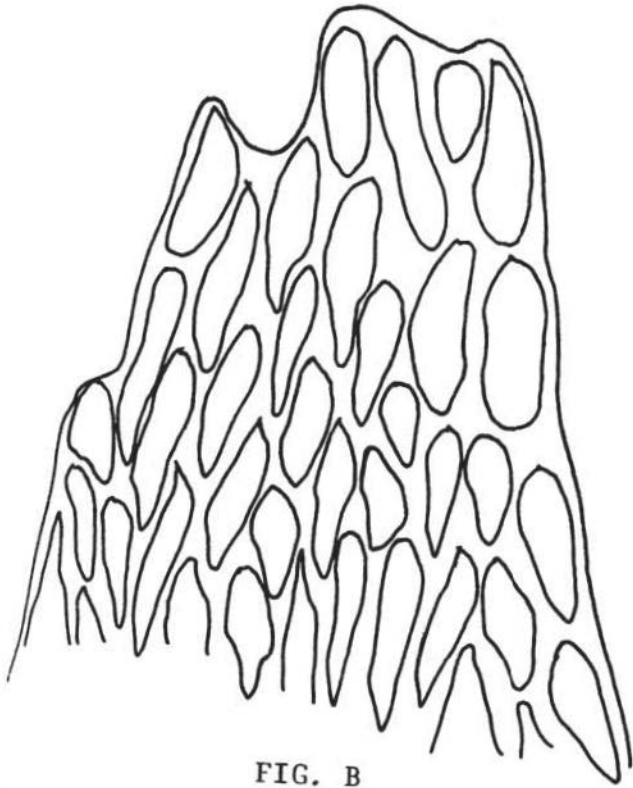


FIG. B

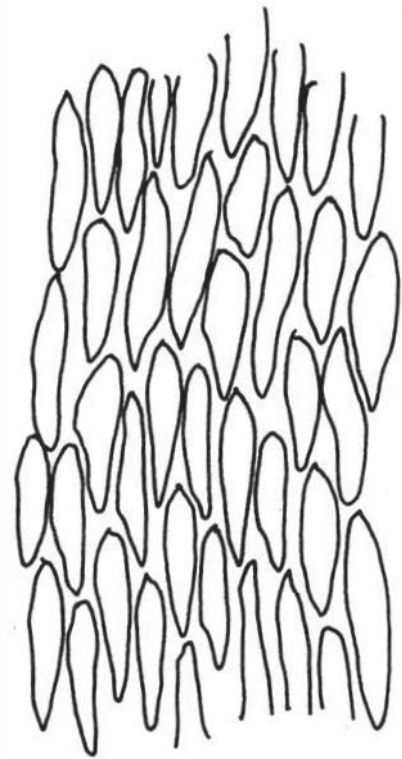


FIG. C

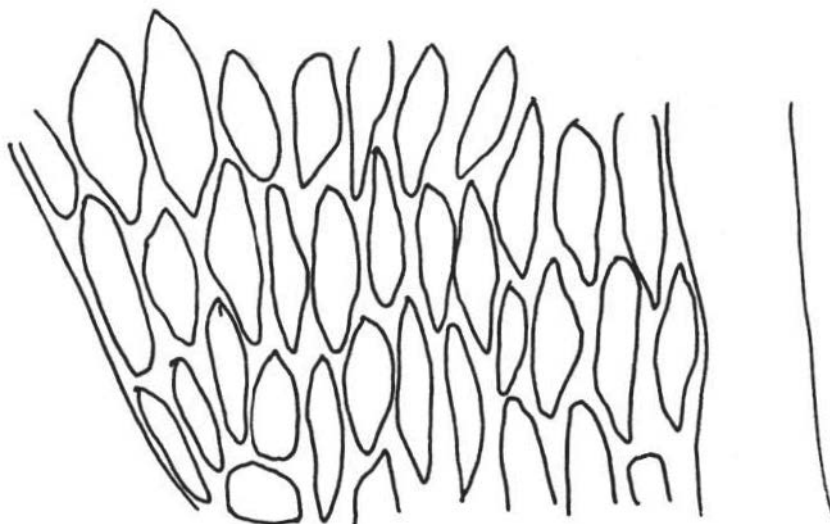


FIG. D

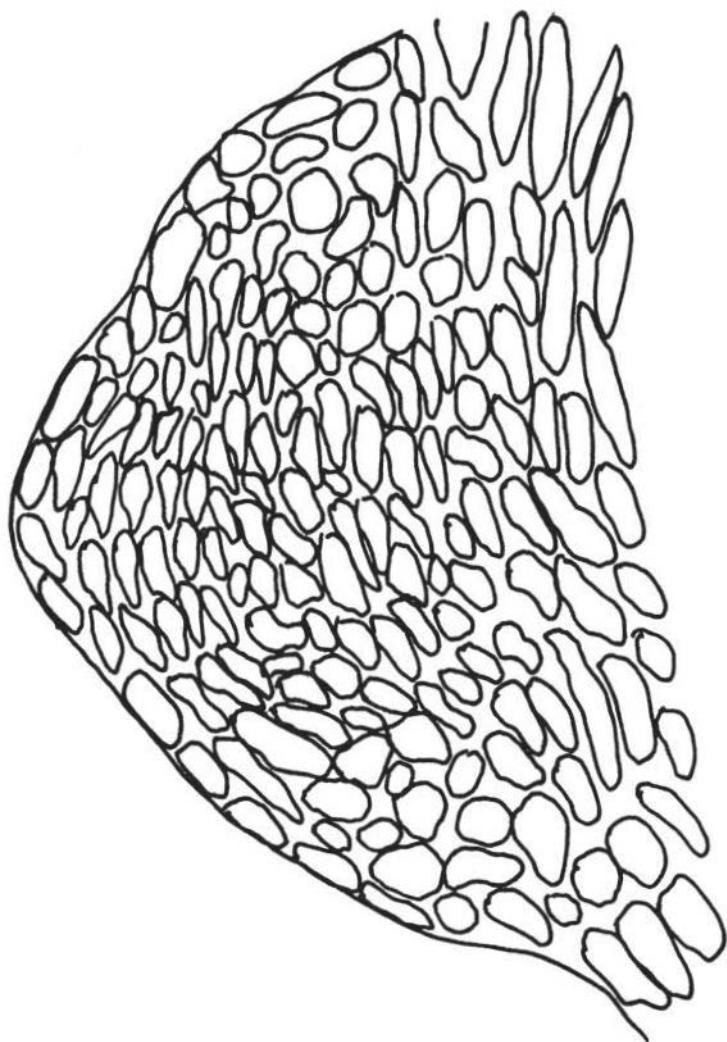


FIG. E

FAMILY: HYPNACEAE

Drepanocladus aduncus (Hedw.) Warnst.

Plants green or yellow green; stems erect, prostrate, or submerged, slender flaccid, 3-10 cm. long or up to 30 cm. in submerged plants, simple, irregularly or regularly pinnately divided, the branches 3-10 mm. long, ends of stems and branches falcate-secund; stems leaves distant, 0.2-0.6 mm. apart at base, falcate-secund, oblong-lanceolate, gradually acuminate from the lanceolate base, plane not plicate, majority 2-3.5 mm. long, 0.6-0.8 mm. wide, in submerged plants 3-5.4 mm. long and 0.6-1 mm. wide, clasping stem at base, decurrent at auricles; costa green, usually extending to about the middle of blade, often extending well into acumen, not excurrent, mostly about 40 μ wide at base, apices long and slenderly acuminate, channeled by the incurved upper leaf margins, margins entire; branch leaves similar but smaller, 1-2 mm. long, 0.4-0.5 mm. wide; cells of leaves narrowly linear, thin-walled, the median mostly 40-60 μ wide, the alar numerous, enlarged, inflated, hyaline, forming distinct, decurrent auricles, extending $1/4$ - $1/2$ distance from margin to seta, frequently extending well toward costa, transition from stem cells to leaf cells gradual; dioicous; calyptra narrowing cucullate, mostly fugacious; seta 2-6 cm. long; capsule inclined to cernuous; operculum conic-apiculate, 0.7 mm. high; urn oblong, 2-2.8 mm. long, 0.4-0.6 mm. in diameter, arcuate, contracted below mouth when dry and empty, perfect, teeth 16, yellowish, about 0.45 mm. long, inner peristome pale, fragile, segments not carinately

split, basal membrane present, cilia 2 and 4, in pairs, nodose; spores yellowish green, 14-16 μ in diameter, papillose, mature in summer.

Habitat: In pools in swamps, bogs, or wet meadows, in lakes, sluggish streams, ditches, sloughs, marshes, common in calcareous places.

Illinois distribution: Fulton, Menard, Peoria, Shelby, and Tazwell Counties.

Drepanocladus aduncus (Hedw.) Warnst. var. kneiffii (B.S.G.) Warnst.

Plants greenish to brownish; ends of stems and branches only slightly falcate-secund to not at all falcate or secund, or only slightly so, oblong-lanceolate, broadly lanceolate or oblong-ovate, gradually acuminate from a lanceolate base, not plicate, sometimes irregularly striate, majority 2.5-3.5 mm. long, 0.6-0.8 mm. wide, slightly decurrent at auricles, costa green, extending well into acumen, not decurrent, apices short, flat, alar cells hyaline or brown; otherwise similar to aduncus.

Habitat: In pools in swamps, bogs, or wet meadows, in lakes, sluggish streams, ditches, sloughs, marshes, etc.

Illinois distribution: Coles, Lake, Shelby, and Will Counties.

Drepanocladus aduncus Hedw. var. kneiffii (B.S.G.) Warnst.

Fig. A - Leaf - 40 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

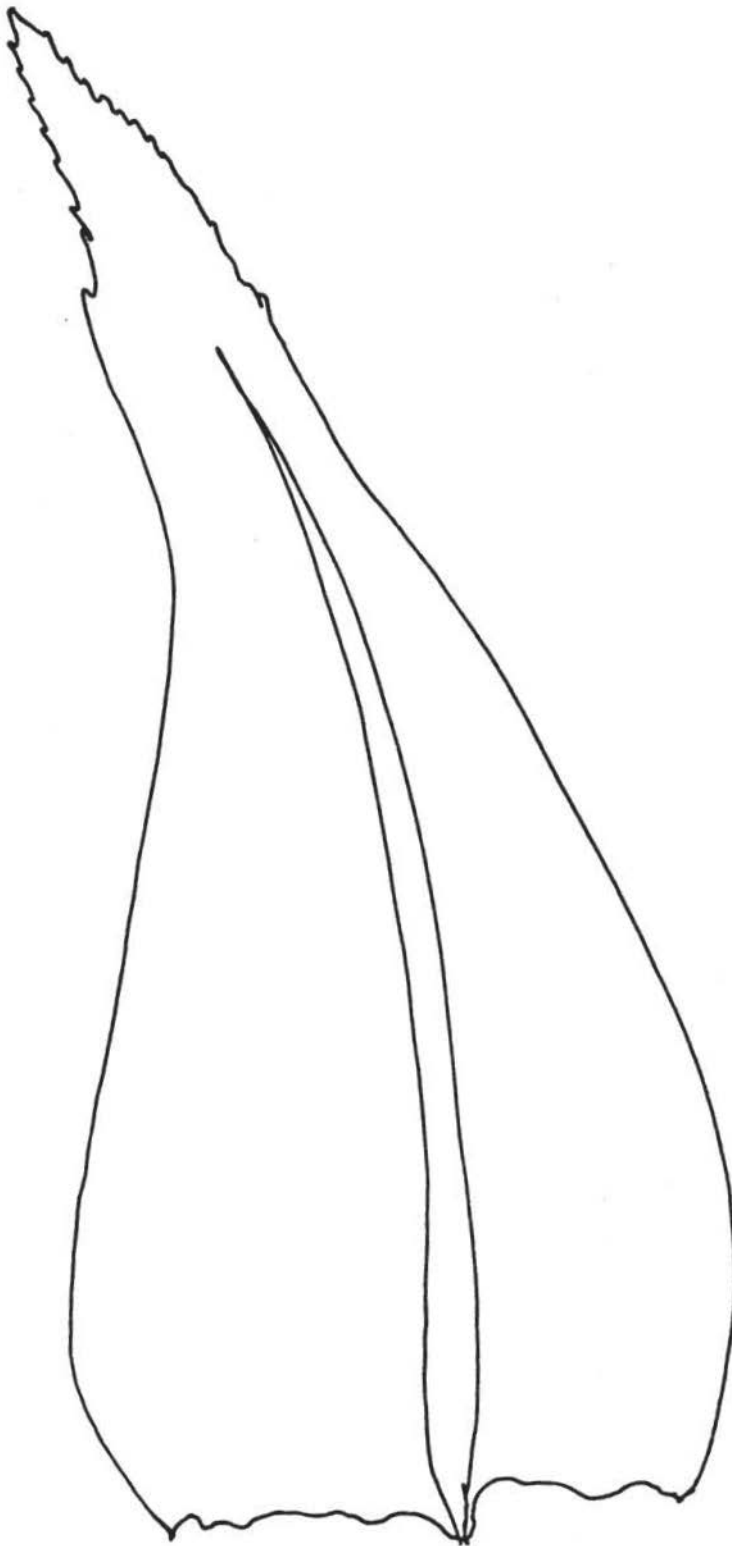


FIG. A

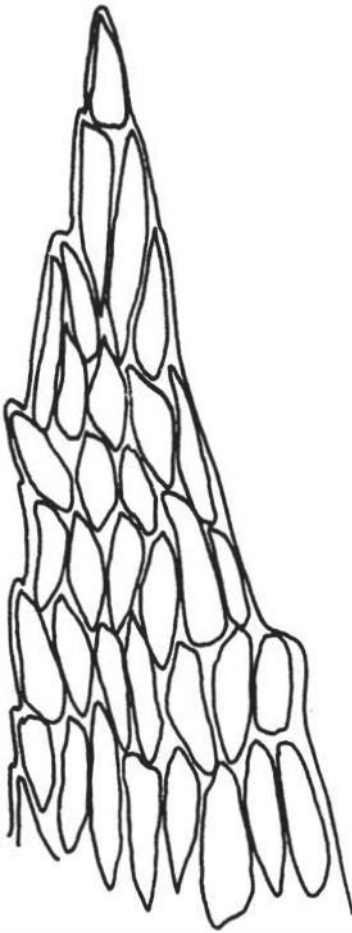


FIG. B



FIG. C

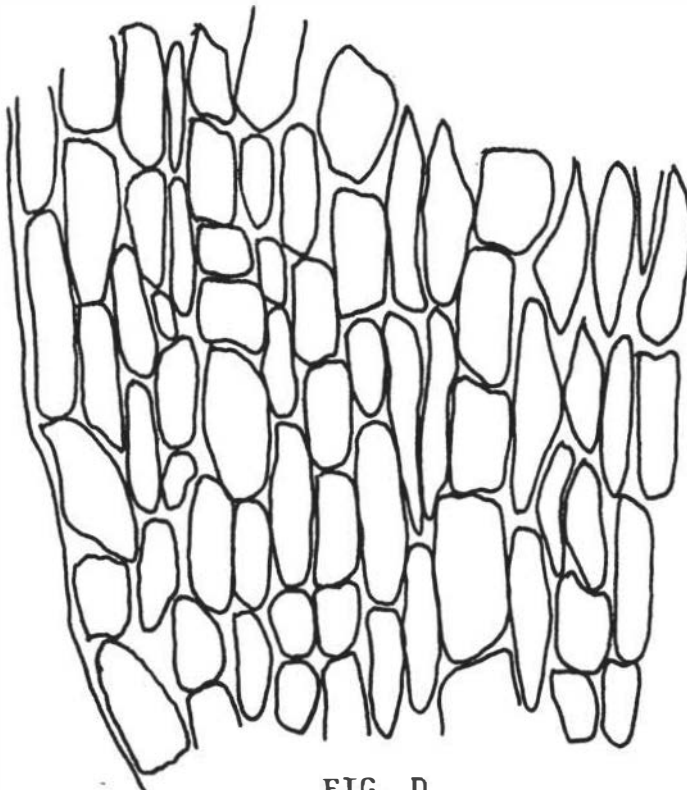


FIG. D

FAMILY: HYPNACEAE

Entodon cladorrhizans (Hedw.) C. Muell.

Plants in wide, yellowish green, glossy mats; stems about 5 cm. long, subpinnately divided, the densely foliated stems and branches flattened, 2-3 mm. wide, acuminate to attenuate at the tips; leaves of branches imbricate, oblong-ovate, very concave, gradually narrowed to insertion, 1-2 mm. long, 0.5-1 mm. wide, costa none, short and double, apices acute to subacute, frequently slightly turned backwards, margins plane or narrowly revolute below, entire, or slightly serrulate at apex; median cells linear-fusiform, 6 μ wide, alar cells numerous, quadrate-rectangular, 8-10 along the margin; leaves of stems larger, bases broader, and apices more abruptly acute; monoicous; calyptra cucullate; seta erect, smooth, reddish brown, glossy, 8-20 mm. long, operculum conic-rostrate, 0.4-1 mm. long; urn oblong-cylindric, 2-2.7 mm. long, 0.5-0.75 mm. in diameter, tapering abruptly to seta, slightly contracted below mouth; annulus large, of 2-3 rows of cells, early deciduous; peristome double, deeply inserted below mouth, teeth chestnut brown, 16, about 0.45 mm. long, with 15-20 cross-bars, articulations close near bases and more distant toward apices, slightly granulose-roughened below in wavy lines, smooth or nearly so above, segments linear, carinate, as long as teeth, slightly granulose-roughened, basal membrane and cilia none; spores castaneous, papillose, 14-20 μ in diameter, mature in late autumn or early winter.

Habitat: On bases of trees, old logs, and sometimes on soil rich in humus.

Illinois distribution: Champaign, Clark, Coles, Cook, Fulton, Johnson, Lake, Menard, Peoria, Pope, Sangamon, Shelby, Union, and Will Counties.

Entodon cladorrhizans (Hedw.) C. Muell.

Fig. A - Leaf - 40 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

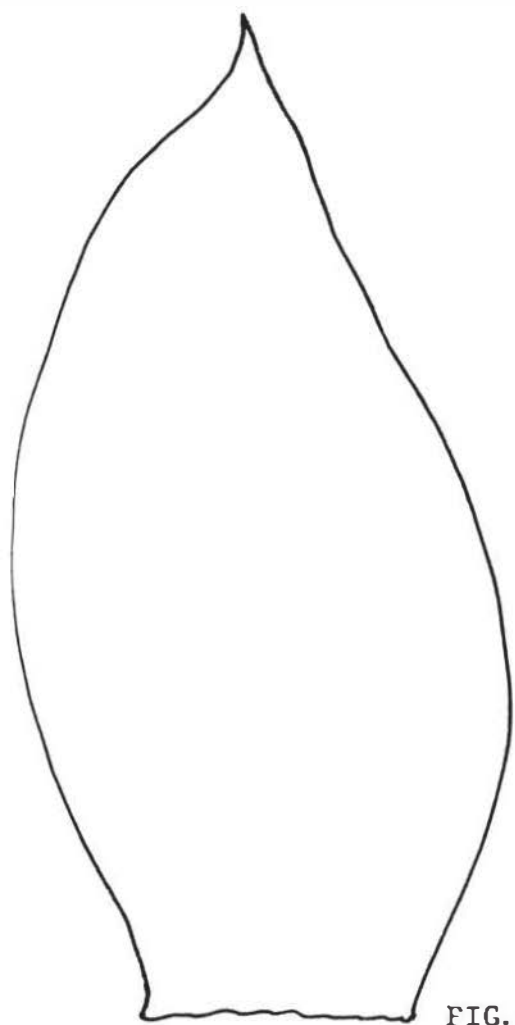


FIG. A



FIG. B

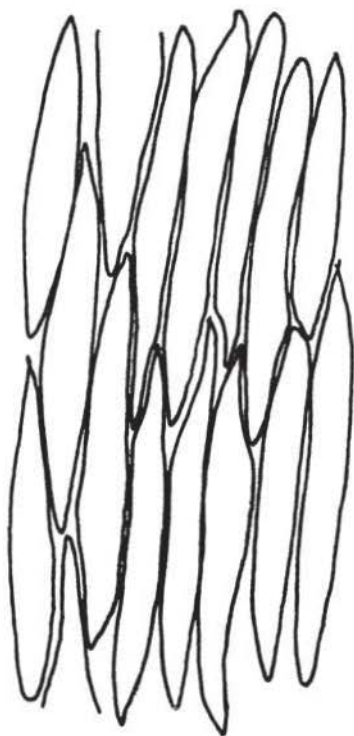


FIG. C

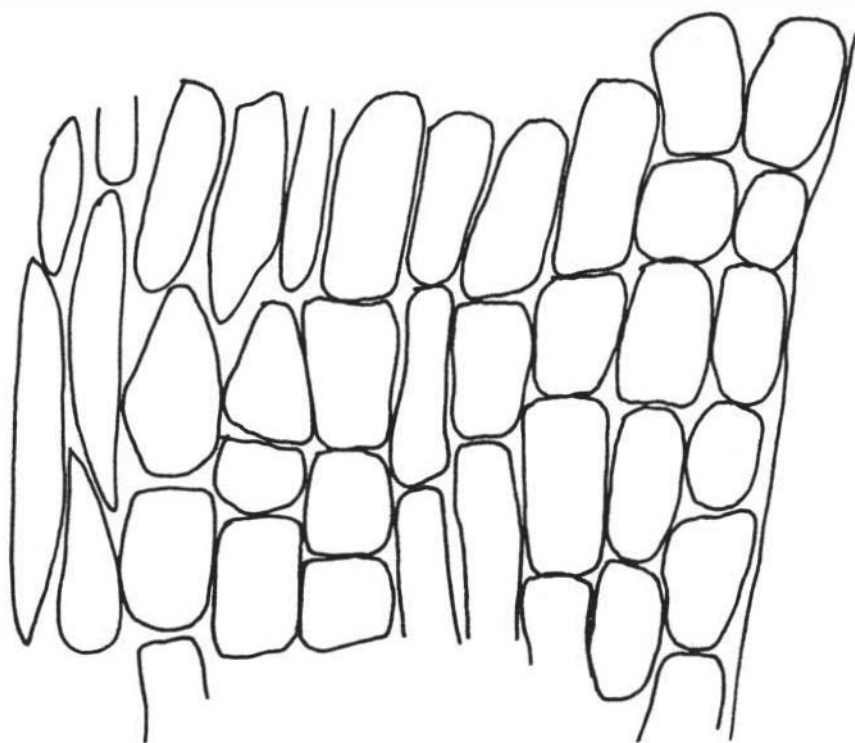


FIG. D

FAMILY: HYPNACEAE

Entodon seductrix (Hedw.) C. Muell.

Plants in wide yellowish green mats, glossy; stems about 5 cm. long, subpinnately divided, julaceous, 5-25 mm. long; leaves imbricate; deeply concave, oblong-elliptical to ovate, narrowed at the insertion, 0.8-1.4 mm. long, about 0.7 mm. wide, costa short and double, apices short apiculate, margins plane or slightly reflexed at the base, entire, or slightly serrulate at apex, median cells of leaves linear, 6 μ wide, alar cells numerous, quadrate, 10-20 along margin, sometimes extending along the margin 1/4 length of the leaf; leaves of stems larger, ovate; monoicous; calyptra cucullate, covering about 1/2 of the capsule; seta reddish brown, erect, glossy, about 1.5 cm. long; capsule reddish brown, erect, symmetric; operculum conic-rostrate, frequently suboblique, 0.5-0.8 mm. long; urn cylindric, 2-3.5 mm. long; annulus rather indistinct, 2-3 rows of small cells, peristome double, teeth 16, deeply inserted below mouth, with 7-10 crossbars appearing above mouth of capsule; spores yellowish, minutely roughened, 14-28 μ in diameter, mature from late summer to winter.

Habitat: On decaying wood, bases of trees, moist soil and rocks, but frequently in rather dry situations.

Illinois distribution: Champaign, Clark, Coles, Cook, Fulton, Lake, McDonough, Menard, Peoria, Rock Island, Shelby, Stark, and Will Counties.

Entodon seductrix (Hedw.) C. Muell.

Fig. A - Leaf - 40 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 160 X.

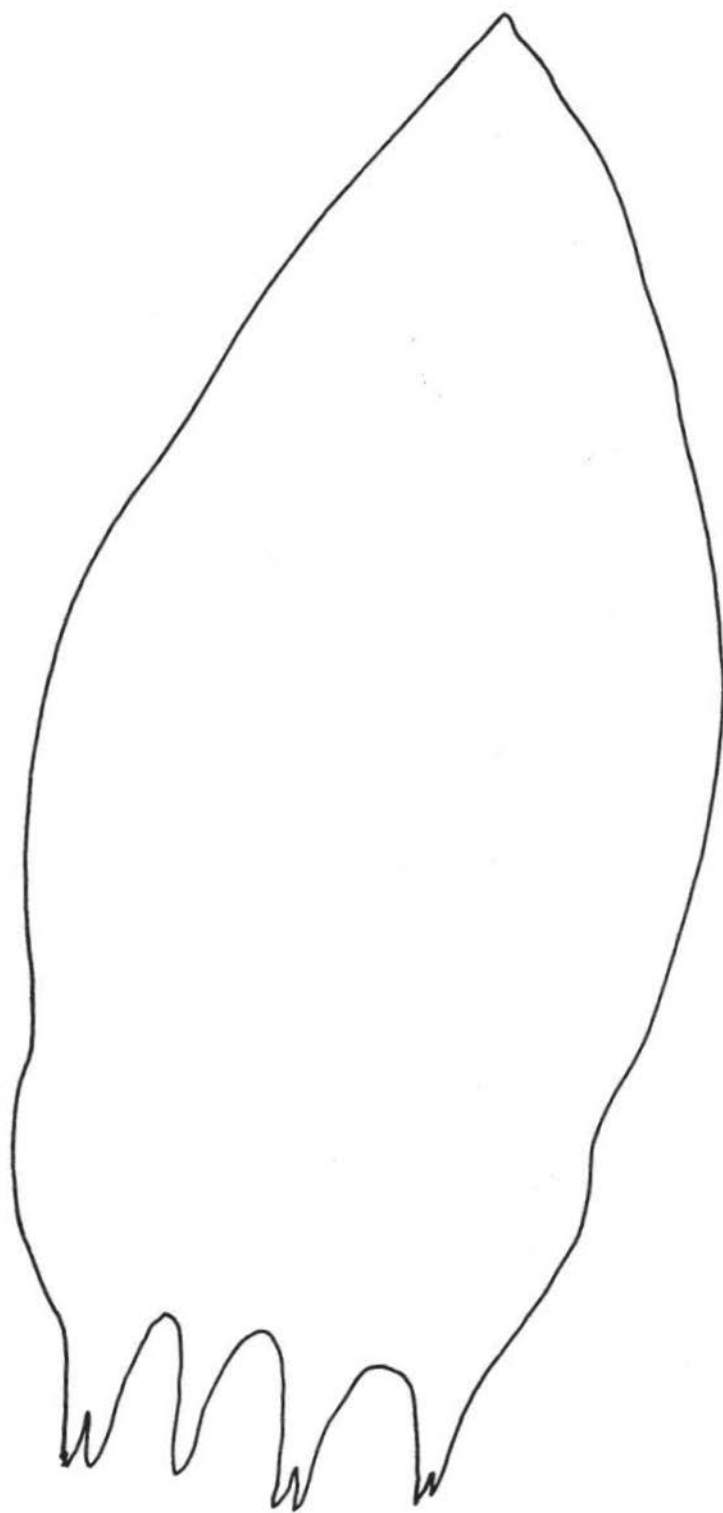


FIG. A

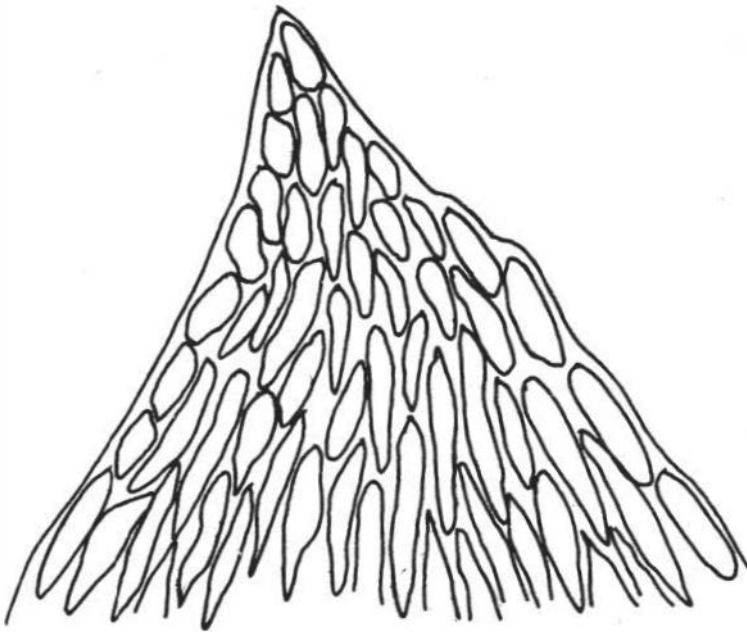


FIG. B

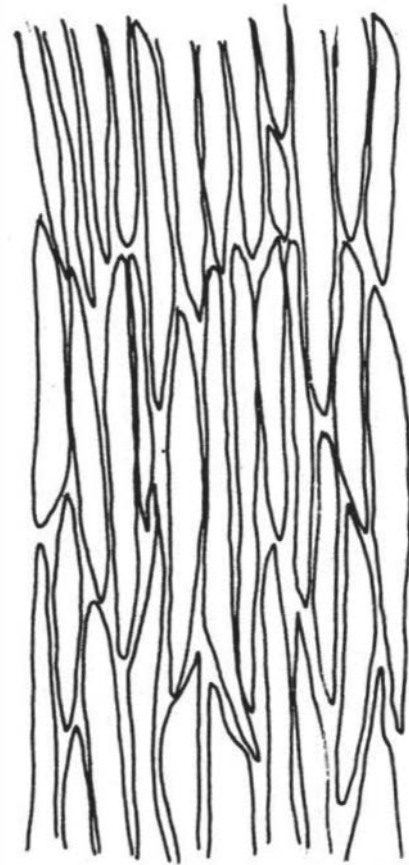


FIG. C

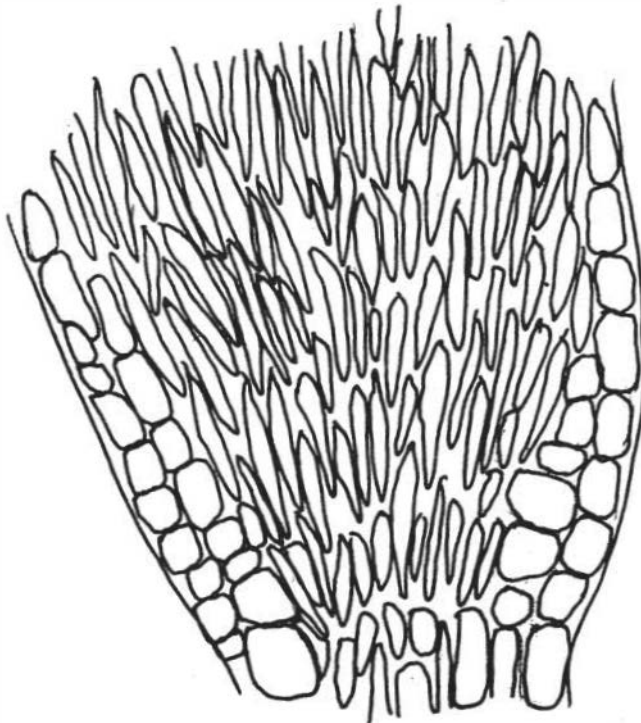


FIG. D

FAMILY: HYPNACEAE

Eurhynchium hians (Hedw.) Jaeger and Sauerb.

Plants slender, in mats, often appearing flattened, yellowish green, slightly glossy, stems prostrate, 3-10 cm. irregularly divided; branches ascending, 3-12 mm.; leaves of branches erect-spreading, complanate when dry, ovate, broadest $1/3$ above base, almost plane to concave, 0.8-1.1 mm. long, 0.5-0.7 mm. wide, sometimes papillose because of projections of angles of cell walls, not decurrent, costa distinct, extending $1/2$ - $4/5$ length of leaf, ending in dorsal spine, apices obtusely acute to short acuminate, often twisted, margins serrate to base; apical cells rhombic, median cells of leaves linear-oblong, prosenchymatous, basal cells shorter, alar cells indistinct, quadrate to rectangular, thick-walled; stems rather distant, ovate, broadest $1/3$ above base, 1-1.6 mm. long, 0.75-1.2 mm. wide; dioicous; calyptra narrowly cucullate, glabrous, fugacious; seta dark reddish brown, 1-2.5 cm. long, very rough with low, rounded papillae, capsule reddish brown, inclined to horizontal, curved; operculum long rostrate, $3/4$ length of urn; urn oblong-cylindric, 2-2.5 mm. long, about 1 mm. in diameter; annulus narrow, deciduous; peristome hypnaceous, perfect, teeth 16, chestnut brown, about 0.6 mm. long, inner peristome fragile, yellowish; spores yellowish green, 10-16 μ in diameter, smooth to slightly papillose, mature in late or early winter.

Habitat: On soil, in moist, shady places.

Illinois distribution: Clark, Coles, Cook, Fulton, Lake, Menard, Peoria, Sangamon, Shelby, and Will Counties.

Eurhynchium hians (Hedw.) J.&S.

Fig. A - Leaf - 40 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

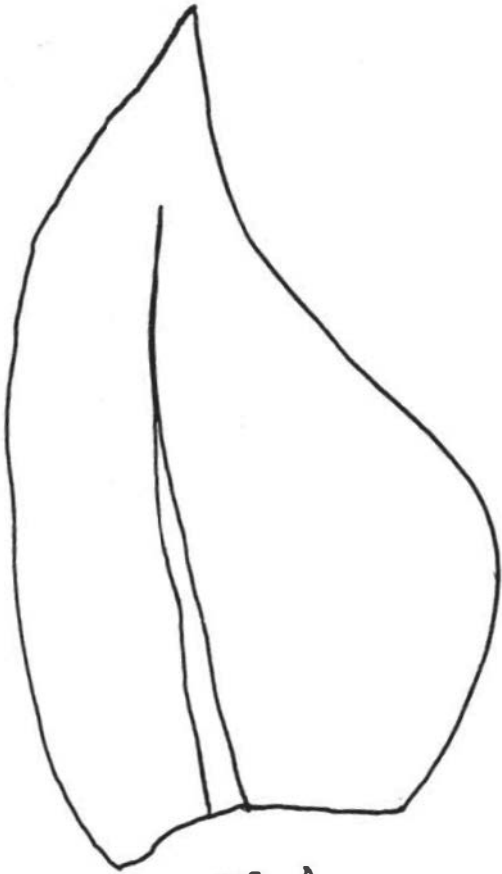


FIG. A

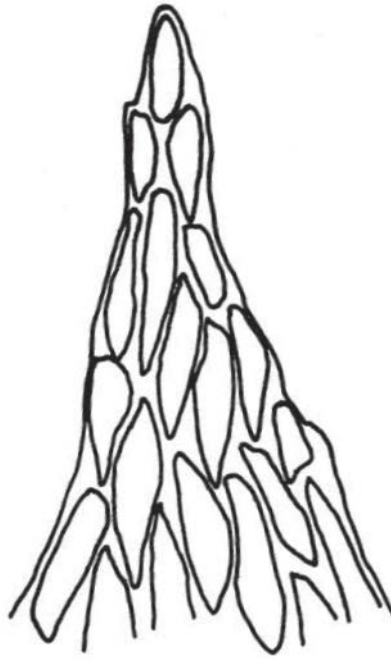


FIG. B

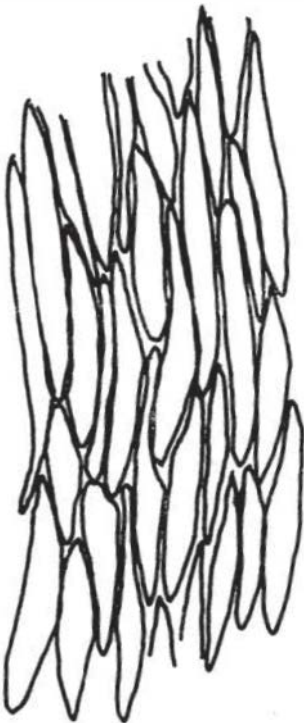


FIG. C

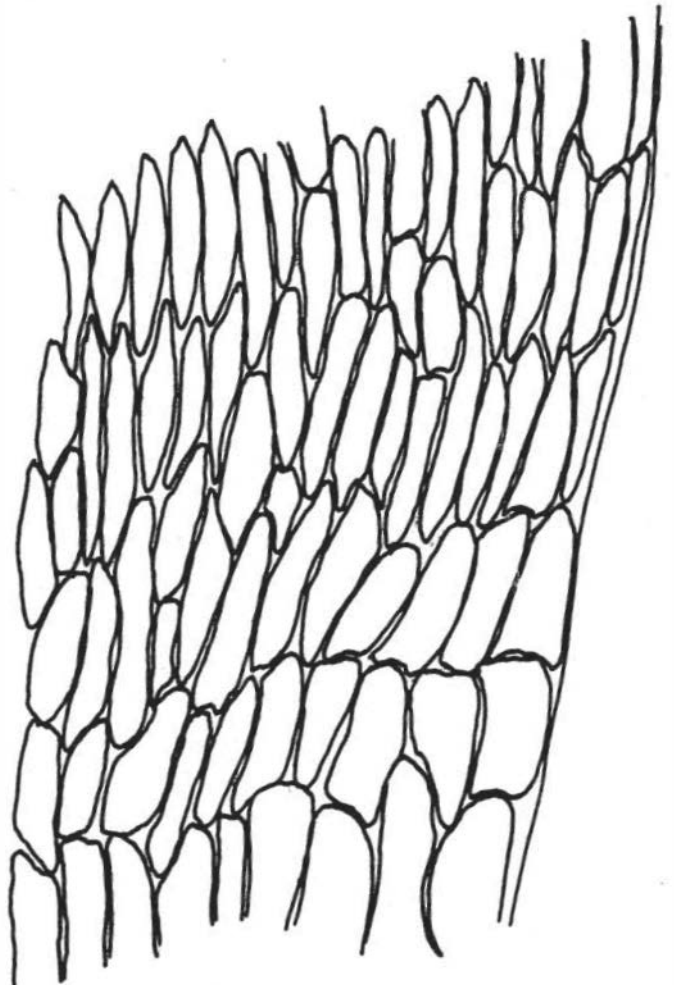


FIG. D

FAMILY: HYPNACEAE

Eurhynchium serrulatum (Hedw.) Lindb.

Plants flattened, in thin mats, bright yellowish green, stems prostrate, irregularly divided, branches elongated; leaves complanate, distant, thin, ovate-lanceolate, sub-concave, 1.5-2 mm., not decurrent, costa narrow, extending beyond the middle of the leaf, apices long acuminate and often twisted; margins serrulate from below the middle to the tip; median cells of leaves prosenchymatous, apical cells not conspicuously different, but slightly shorter and broader, leaves of stem cordate-triangular, abruptly and narrowly acuminate, apices very slender, margins subserrulate above; autoicous; calyptra narrowly cucullate, glabrous, fugacious; seta chestnut brown, smooth, about 2.5 cm. long; capsule chestnut brown, cernuous; operculum conic, slenderly rostrate, beak long, recurved; urn curved, about 2 mm. long; annulus large, deciduous; peristome hypnaceous, perfect, teeth 16, yellowish brown, narrowly lanceolate; spores yellowish, finely papillose, 9-12 μ in diameter, mature in early fall.

Habitat: Humus, rotten logs, in moist, shaded places.

Illinois distribution: Champaign, Clark, Coles, Cook, Effingham, Fulton, Kankakee, LaSalle, McDonough, Marion, Menard, Ogle, Peoria, Rock Island, Sangamon, and Shelby Counties.

Eurhynchium serrulatum (Hedw.) Lindb.

Fig. A - Leaf - 26.5 X.

Fig. B - Apical cells - 160 X.

Fig. C - Median cells - 160 X.

Fig. D - Alar cells - 160 X.

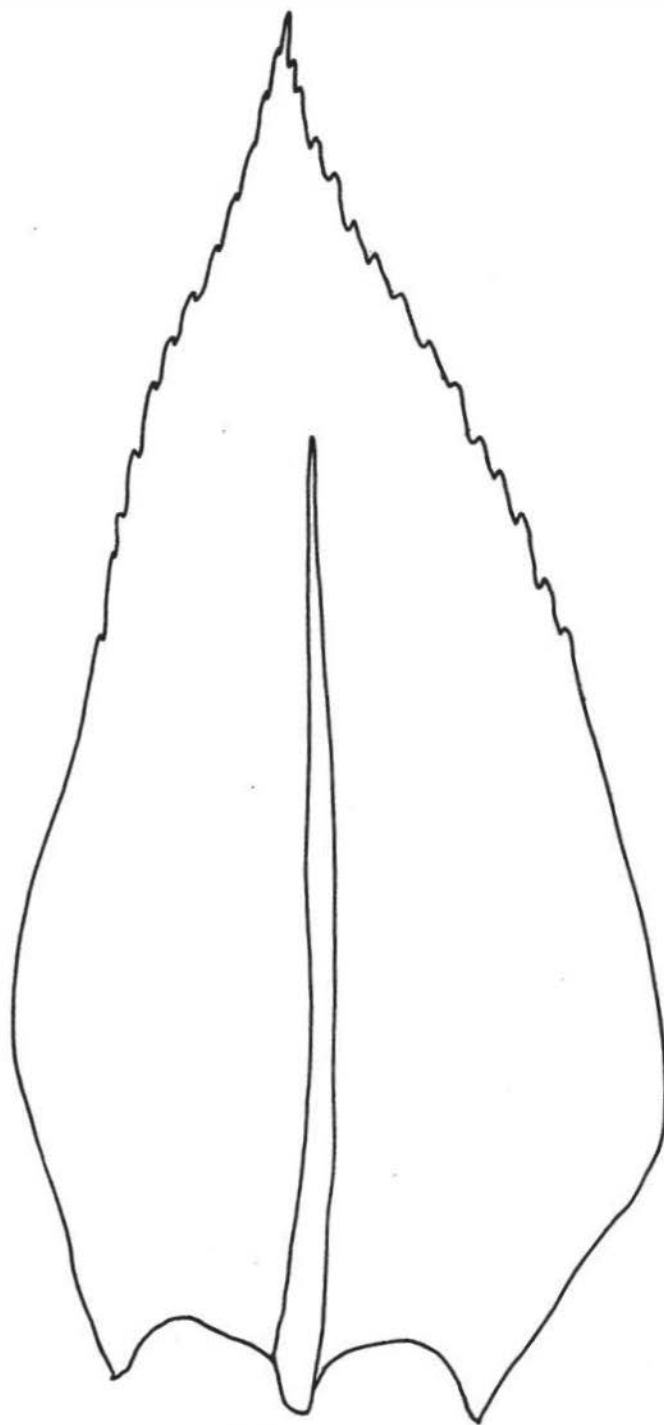


FIG. A

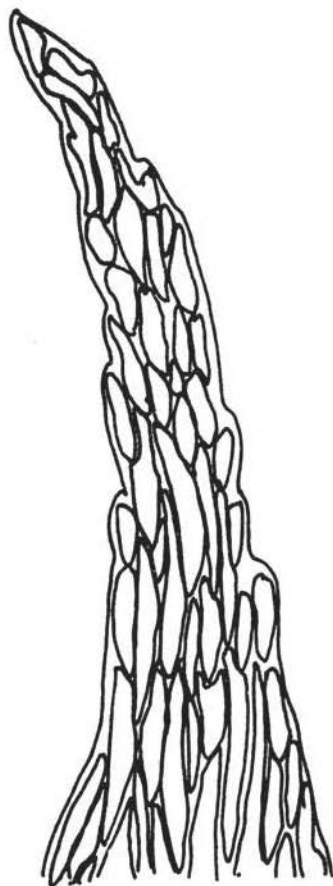


FIG. B

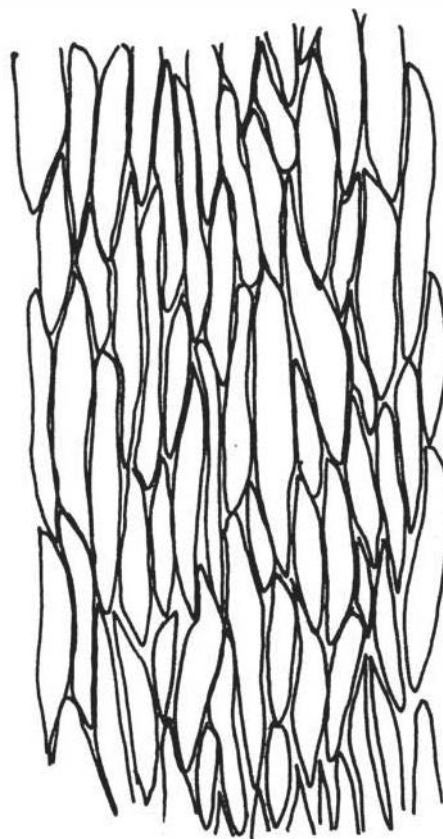


FIG. C

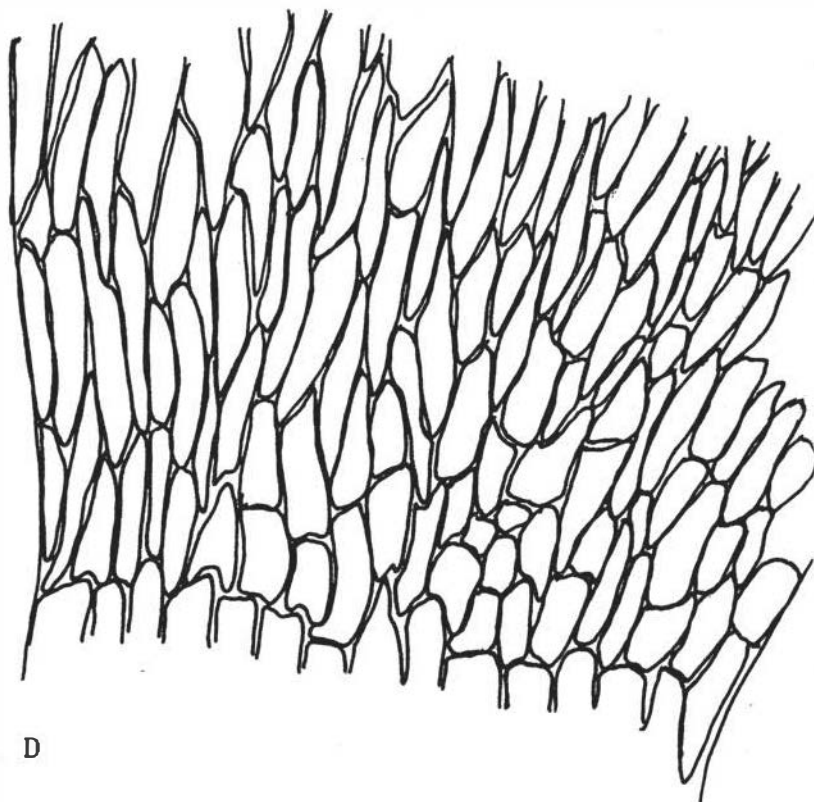
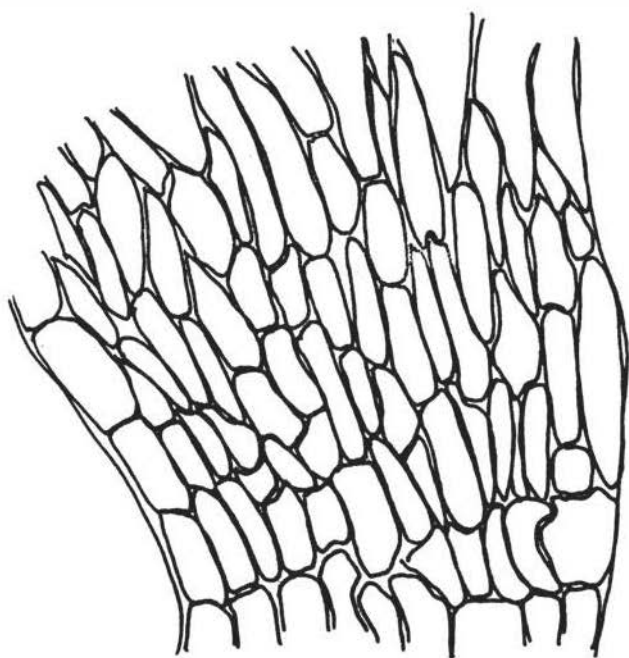


FIG. D

FAMILY: HYPNACEAE

Hygroamblystegium irriguum (Wils.) Leoske

Plants medium in size, dark green to blackish green; stems rigid, irregularly divided; paraphyllia few, at the insertion of branches with stem; leaves erect-spreading to spreading, elongate-triangular to triangular-ovate, 1-1.5 mm. long, narrowed to the insertion, slightly decurrent, costa thick and wide, narrowed into the acumen, percurrent or merging into the apex and becoming indistinct, apices gradually and rather long acuminate, the tip acute, margins plane, entire to sub-serrulate; median cells of leaves elongate-hexagonal or hexagonal-rhomboidal, 9-20 μ long, basal cells wider, subquadrate, with walls thicker and often colored, frequently but not always one or more rows of basal cells enlarged and slightly inflated, alar cells not forming distinct auricles; autoicous or dioicous; calyptra small, conical, fugacious; seta brownish, 1.5-2.5 cm. long; capsule brownish, subcylindric, strongly arcuate; operculum about 0.9 mm. high, convex-conic, apiculate; urn strongly arcuate and contracted below mouth when dry and empty, 2-2.5 mm. long; annulus of 3 rows of cells; peristome perfect, hypnaceous, teeth 16, orange, strongly trabeculate, bordered, segments yellowish to hyaline, slightly shorter than the teeth, carinate, split along keel, basal membrane 0.25-0.3 mm. high, cilia 2-3, about length of segments, hyaline, papillose, nodose; spores papillose, 14-20 μ in diameter, mature in spring or in early summer.

Habitat: On various substrata, in water in very moist places.

Illinois distribution: Clark, Coles, Cook, Jackson, Shelby, and Will Counties.

Hygroamblystegium irriguum (Wils.) Leoske

Fig. A - Leaf - 160 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 640 X.

Fig. D - Alar cells - 640 X.

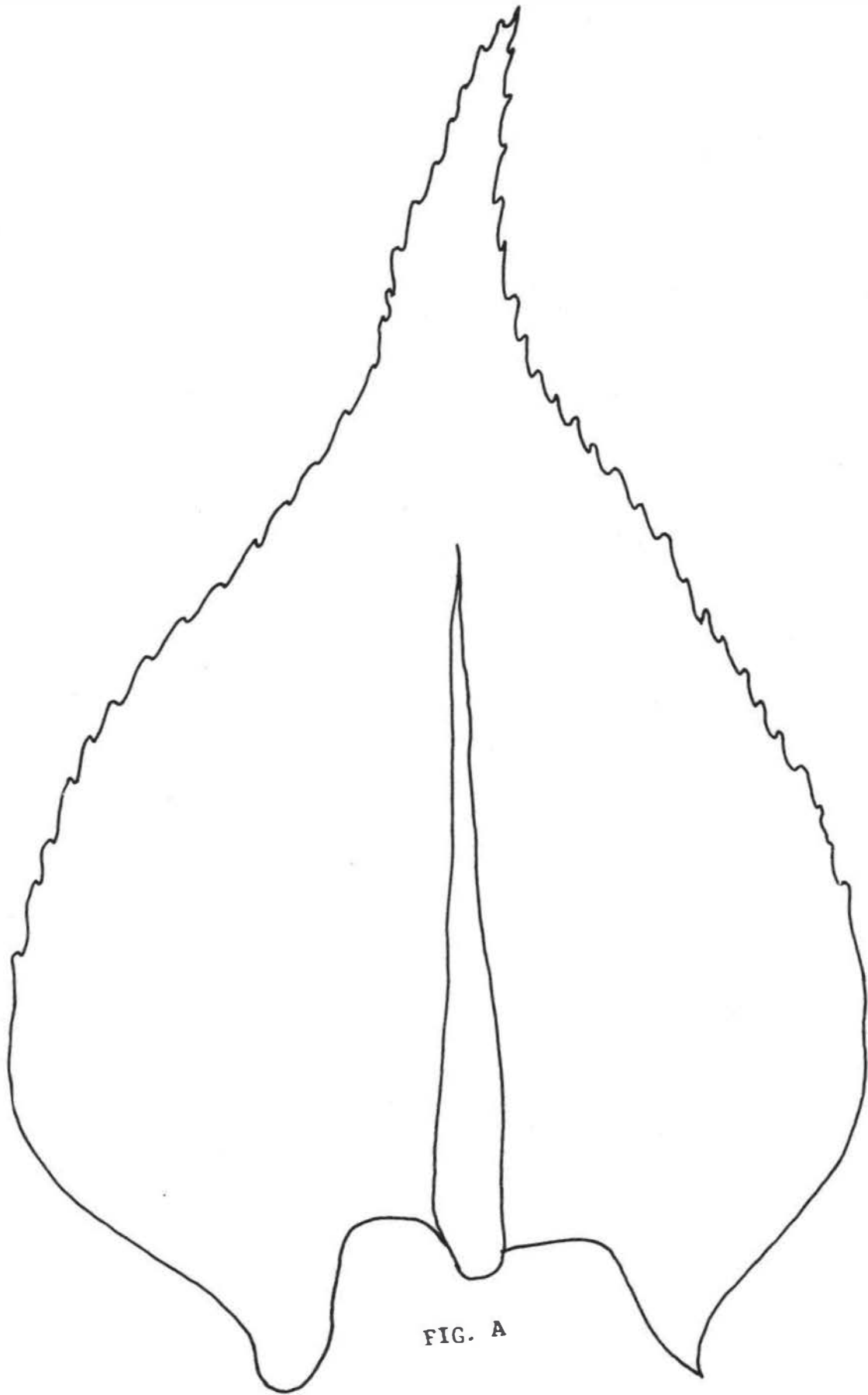


FIG. A



FIG. B

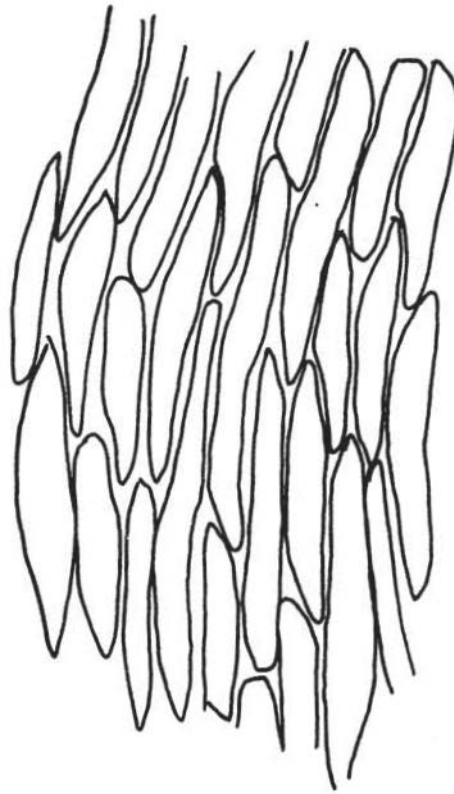


FIG. C

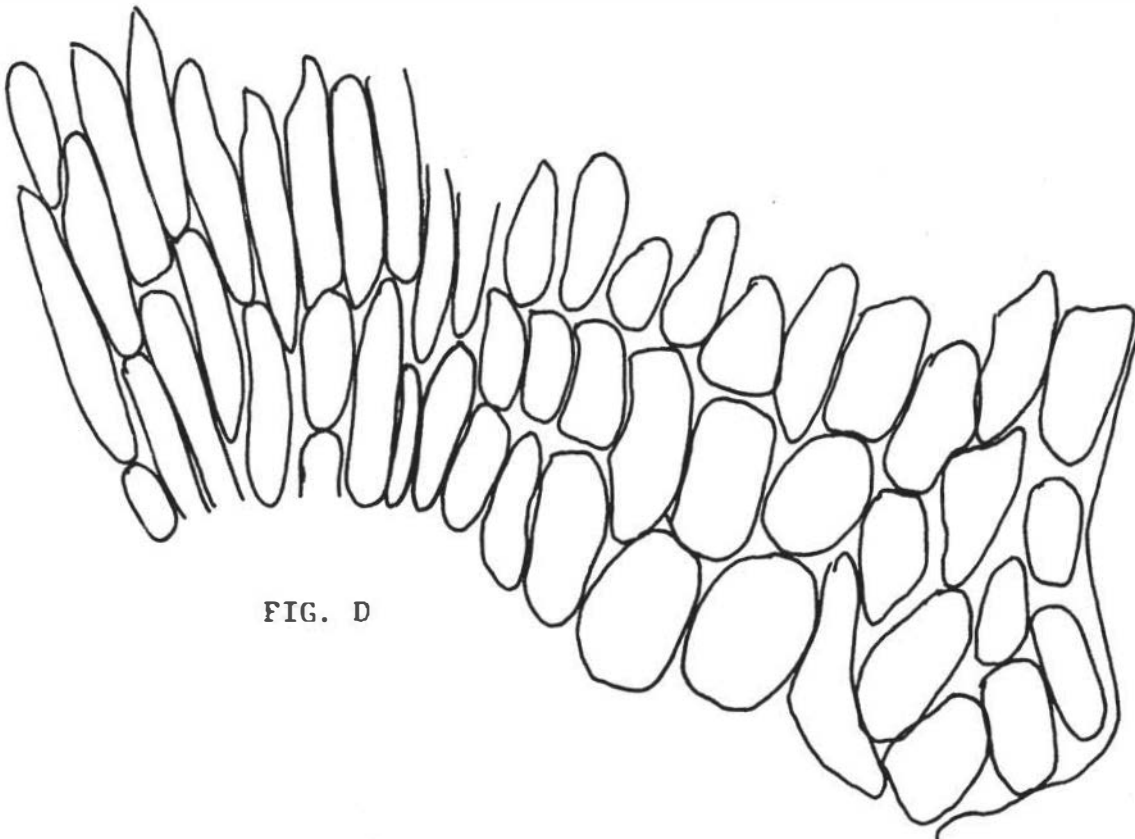


FIG. D

FAMILY: HYPNACEAE

Hypnum arcuatum Lindb.

Plants robust, in wide mats, bright green to yellowish green above, brownish below, glossy; stems reddish below, prostrate to ascending, irregularly to almost regularly pinnately divided, ends of stems and branches hooked; cortical cells of stem large, thin-walled, colorless; leaves of stems in two rows, falcate-secund, sometimes slightly plicate or rugose when dry, ovate-oblong, concave, 1.6-2.5 mm. long, decurrent, costa lacking, or short and double, occasionally one branch longer and extending 1/3 length of blade, apices broadly acuminate, acute, or obtuse, usually flat but sometimes channelled, margins plane, entire throughout or serrulate at apex; median cells of leaves linear-flexuose, about 5 μ wide, basal cells shorter, broader, thick-walled, pitted, often colored with age, the decurrent auricles composed of large, oblong, abruptly inflated, thin-walled, hyaline cells, bordered above by smaller, irregular to subquadrate, usually brownish, pellucid, thicker-walled cells; dioicous; calyptra narrowly cucullate, glabrous, fugacious; seta brownish, 2.5-3 cm. long; capsule inclined to horizontal, 2.5-3.5 mm. long, 0.75-1 mm. in diameter; operculum conic-apiculate; urn curved, oblong-cylindric, plicate when dry and empty, 2-2.5 mm. long; annulus large, deciduous; peristome hypnaceous, perfect, teeth golden yellow, 16, papillose in upper portion, about 0.6 mm. long, inner peristome yellow, 16, papillose in upper portion, about 0.6 mm. long, inner peristome yellow, almost smooth,

basal membrane about 0.18 mm. high, segments split near apices, cilia 2-3, nodose; apores yellowish, smooth, 10-18 μ in diameter, mature in late spring or early summer.

Habitat: On soil, in woods, and chiefly in wet places, often among grasses.

Illinois distribution: Clark, Coles, Lake, and Shelby Counties.

Hypnum arcuatum Lindb.

Fig. A - Leaf - 40 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

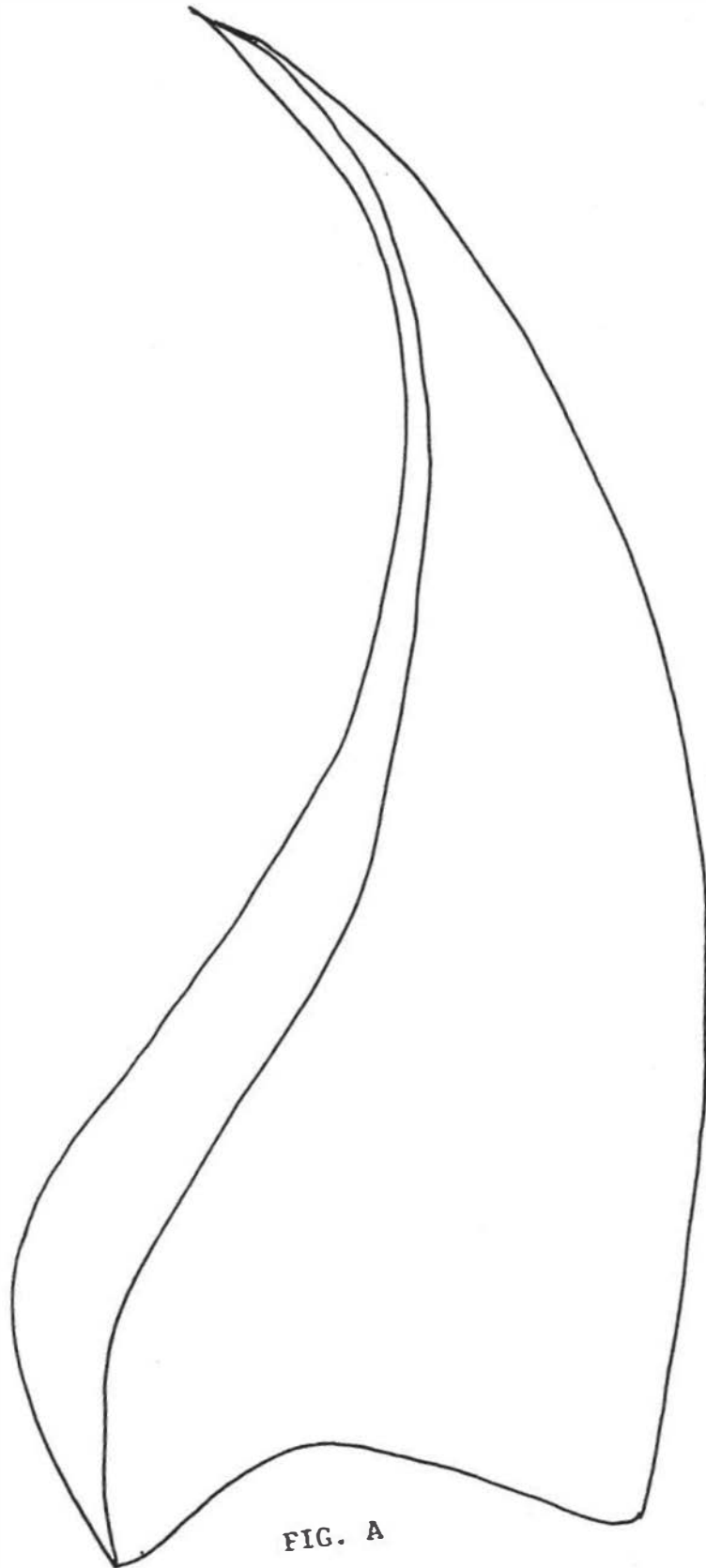




FIG. B



FIG. C

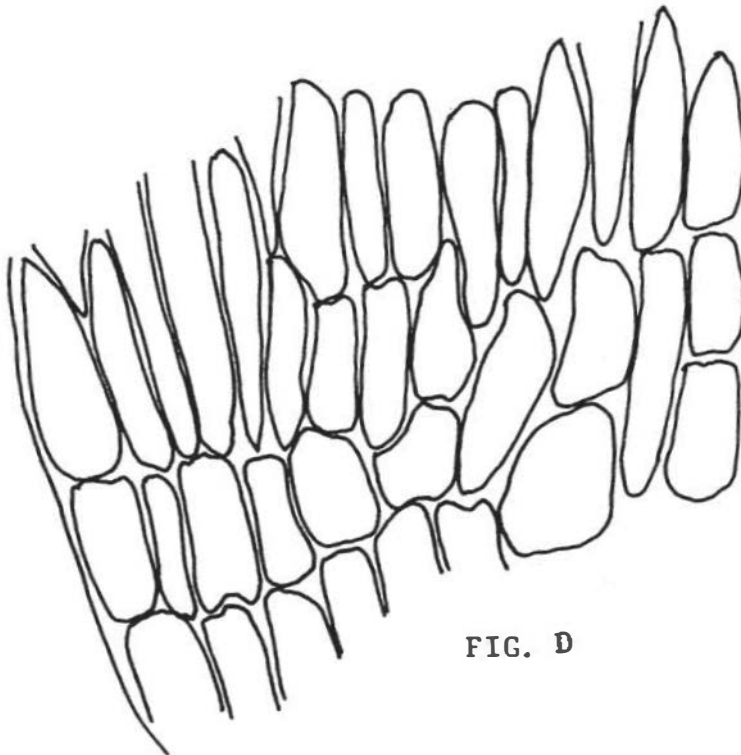


FIG. D

FAMILY: HYPNACEAE

Leptodictyum riparium (Hedw.) Warnst.

Plants variable, depending on amount of moisture and substratum; stems about 10 cm., irregularly dividing into moderately short spreading branches, forming loose mats; leaves on main stems distinctly complanate, distant, obliquely attached to stem, erect-spreading, forming with stem an angle of 30-60 degrees, ovate-lanceolate, gradually tapering into a long slender acumination; margins entire, base slightly decurrent, base clasping, costa strong at base, extending $1/2-3/4$ length of blade, ending on one narrow cell, median cells of leaves narrowly linear-rhomboidal, 8-9 μ wide, with thin walls, basal cells subrectangular, 8 μ wide, 1-2 longer marginal cells, alar cells not forming auricles; autoicous; calyptra small, conical, fugacious; seta 1-2.5 cm. long; capsule inclined, operculum conic, apiculate; urn oblong to cylindric; annulus broad, 2-3 rows of cells; peristome perfect, hypnaceous, teeth dark orange, 16, segments keeled; spores minutely roughened, 11-14 μ in diameter, mature in spring.

Habitat: On various substrata, in water or very moist places.

Illinois distribution: Christian, Clark, Coles, Effingham, Fulton, Jackson, Menard, and Shelby Counties.

Leptodictyum riparium (Hedw.) Warnst.

Fig. A - Leaf - 40 X.

Fig. B - Apical cells - 160 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

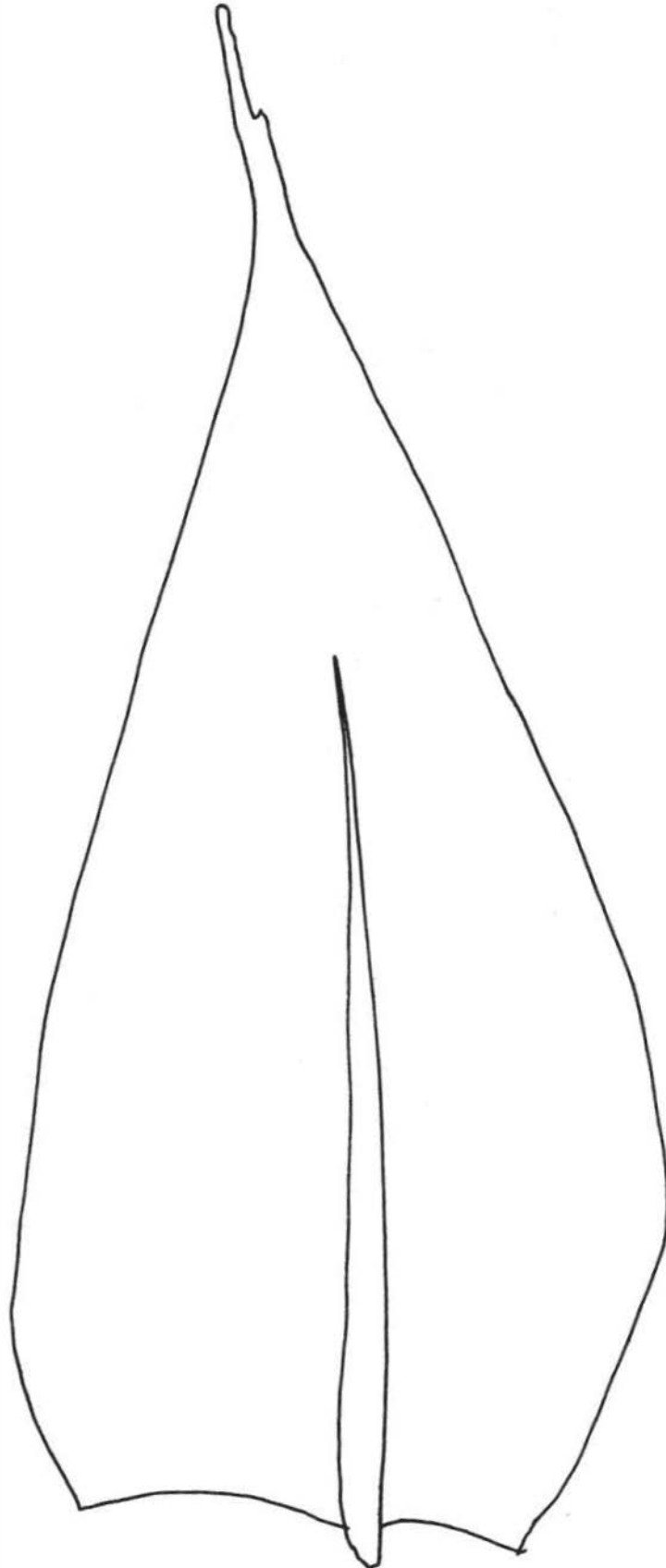


FIG. A

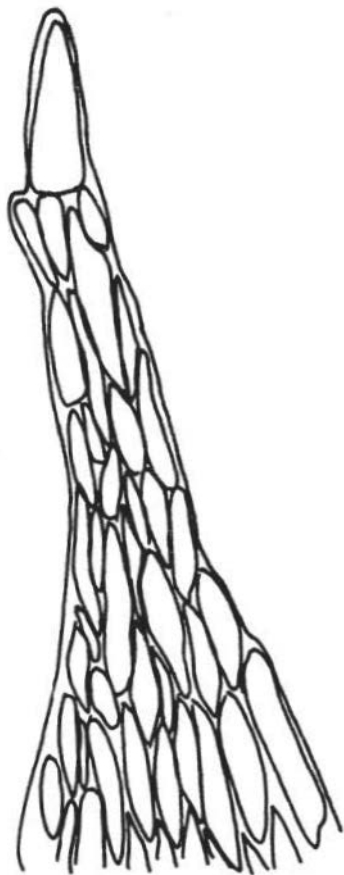
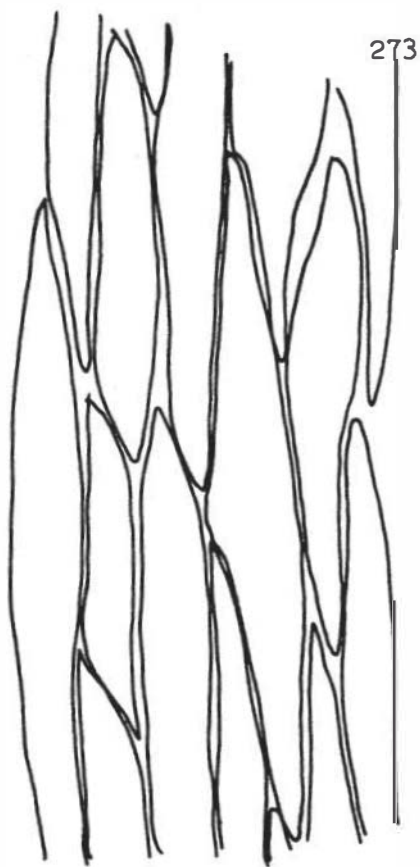


FIG. B



273

FIG. C

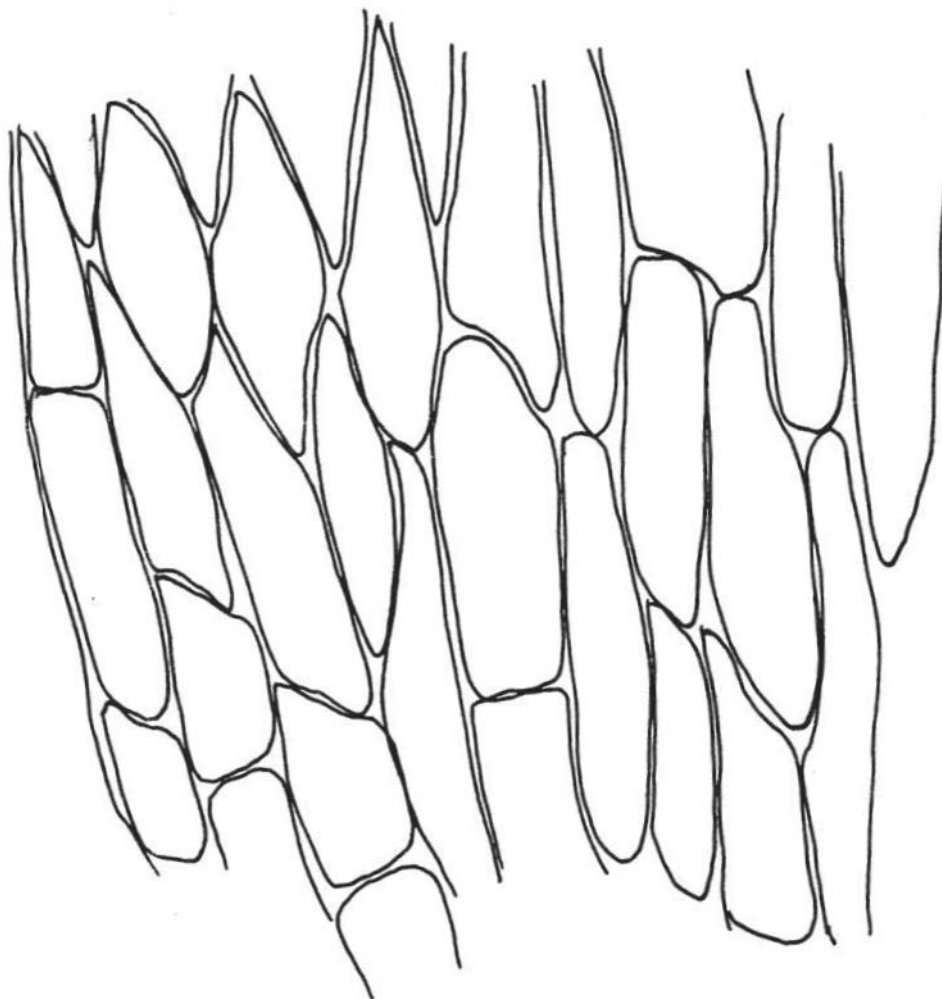


FIG. D

FAMILY: HYPNACEAE

Leptodictyum trichopodium (Schultz) Warnst.

Plants in loose tufts or mats, light green or yellowish, darker in older portions; stems 2-4 cm. long, with branches prostrate to erect-ascending; leaves moderately distant, widely spreading, nearly at right angles to stem, not complanate, ovate to ovate-lanceolate, widest in basal $1/8$, rather abruptly long acuminate, plane or nearly so, 1-1.6 mm. long, bases not decurrent to slightly so, costa strong, extending $6/7$ length of blade, acumen ending in 1 cell, margins slightly serrulate by projecting cells; median cells of leaves elongate-hexagonal to rectangular, 9-12 μ wide, with thin walls, basal cells wider, rectangular to oblong, in several rows, alar cells scarcely different; monoicous; calyptra small, conical, fugacious, seta 2.5-4 cm. long; capsule light brown, darker with age, cernuous; operculum conic-apiculate; urn ovoid to oblong-cylindric, unsymmetric to subarcuate, 2-3 mm. long, 0.75-1 mm. in diameter; annulus present; peristome perfect, hypnaceous, teeth 16, brownish yellow, about 1.6 mm. long, inner peristome yellowish, segments approximate length of teeth, carinately split, basal membrane 0.24 mm. high, cilia 1-4, often 2, shorter than segments; spores minutely roughened, 14-18 μ in diameter, mature from late autumn to early spring.

Habitat: On moist earth.

Illinois distribution: Christian, Clark, Coles, McDonough, and Shelby Counties.

Leptodictyum trichopodium (Schultz) Warnst.

Fig. A - Leaf - 40 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

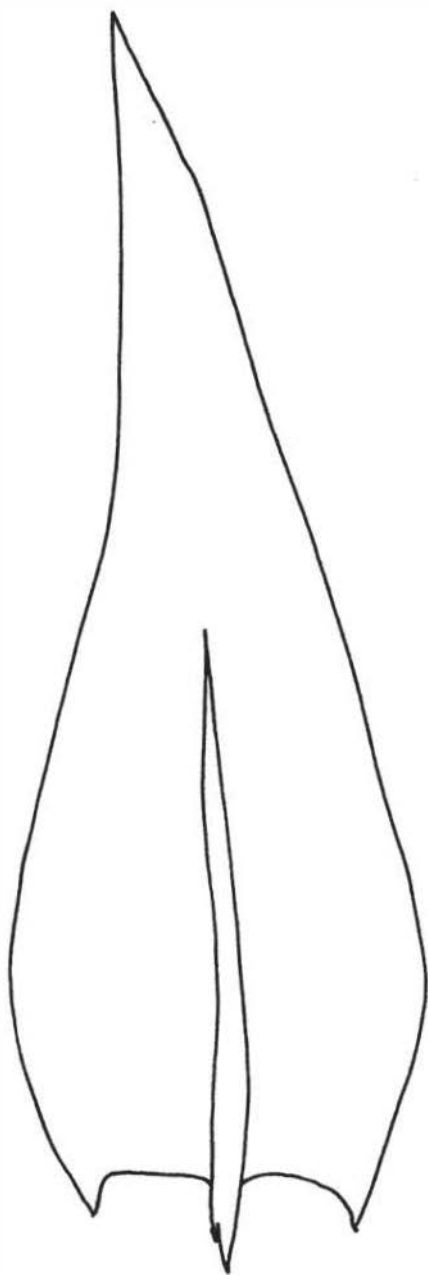


FIG. A



FIG. B

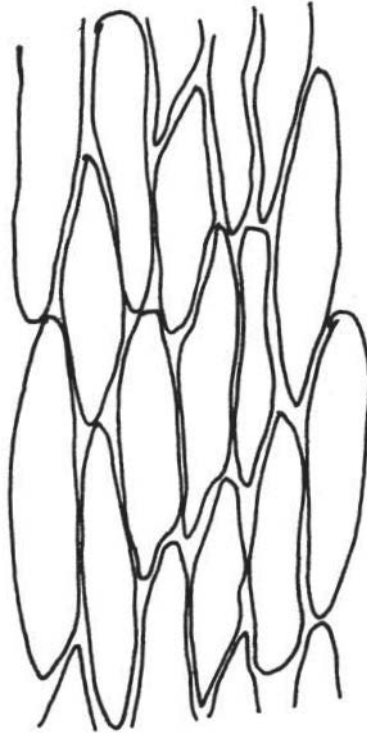


FIG. C

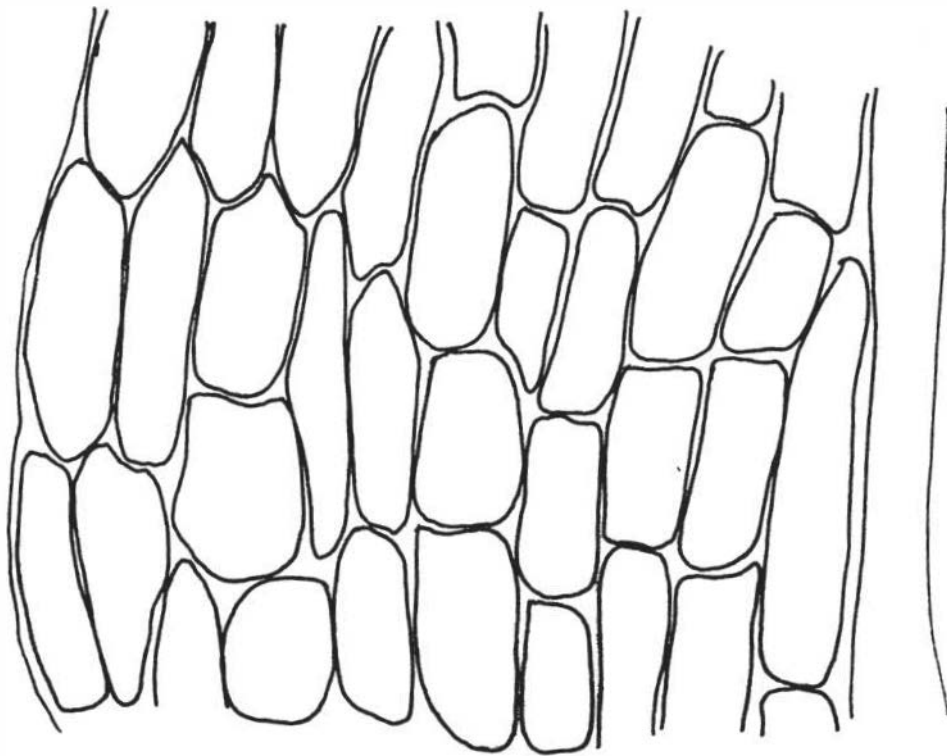


FIG. D

FAMILY: HYPNACEAE

Plagiothecium denticulatum (Hedw.) B.S.G.

Plants moderately robust, in flattened mats, green to pale green, glossy, varying in robustness; stems prostrate, irregularly divided, branches prostrate to ascending; median leaves of well developed branches complanate, slightly spreading, scarcely shrinking in drying, overlapping wet or dry, oblong-ovate, broadest slightly above base, slightly concave and unsymmetric, 1.5-3 mm. long, bases slightly narrowed to insertion, strongly decurrent, costa none to short and double, occasionally forking with one branch reaching 1/2 length of leaf, apices acute to short acuminate, margins plane or sometimes narrowly recurved below, entire except a few occasional short teeth near apex; median cells linear to linear-rhomboidal, 10-15 μ wide, usually chlorophyllose, basal cells broader and shorter, subrectangular, pellucid, alar cells subrectangular, slightly inflated, hyaline and strongly decurrent, not forming distinct auricles; monoicous; calyptra small, split on one side, whitish to straw-colored, smooth fugacious; seta 2.5-4 cm. long; capsule suberect to horizontal, 2-3 mm. long, usually smooth when dry; operculum long conic to short rostrate, about 1/3 as long as urn; the urn cylindric, 1.5-2 mm. long, about 0.75 mm. in diameter, somewhat unsymmetric or curved, with a distinct neck, contracted below mouth when dry and empty; annulus large, deciduous, of 2-3 rows of cells; peristome perfect, of 16 teeth, about 0.6 mm. long, hyaline and papillose above, yellowish below, lance-subulate, segments slender, sometimes carinately split, as long as teeth, basal

membrane $1/3-1/2$ as high as peristome, cilia 2-3, nodose; spores yellowish or green, smooth, 8-13 μ in diameter, mature in summer.

Habitat: On rock humus, and rotten logs, in moist, shaded places.

Illinois distribution: Clark, Fulton, Jackson, Menard, Peoria, and Shelby Counties.

Plagiothecium denticulatum (Hedw.) B.S.G.

Fig. A - Leaf - 40 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

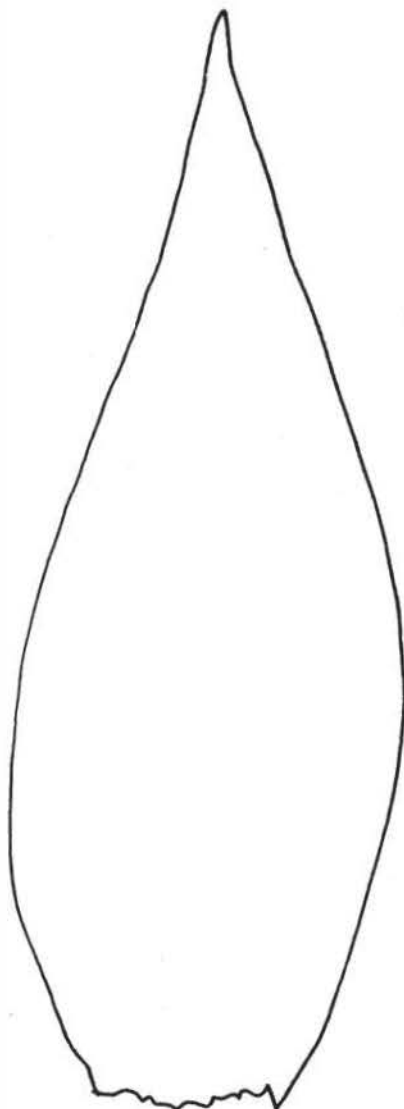


FIG. A

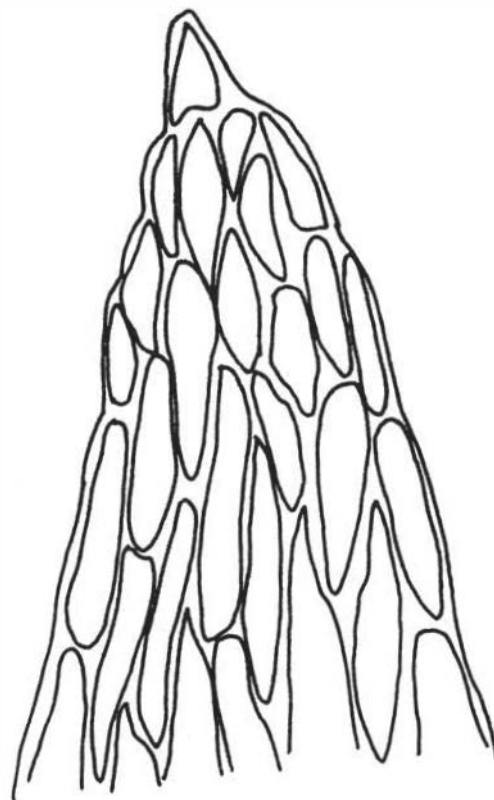


FIG. B



FIG. C

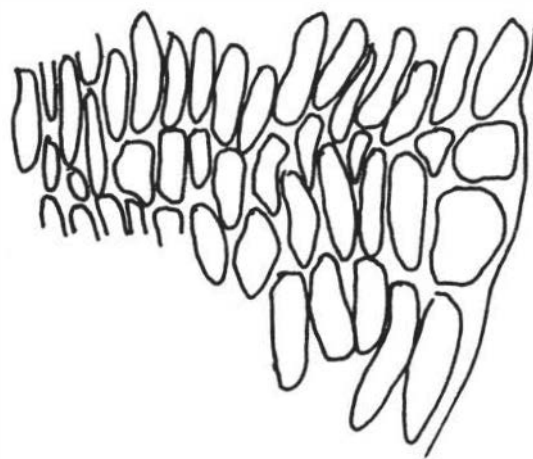


FIG. D

FAMILY: HYPNACEAE

Plagiothecium deplanatum (Sull.) Grout

Plants small, flattened, in thin mats, bright golden green, glossy; stems prostrate, 2-3 cm. long, irregularly divided, branches usually prostrate, ends of foliated stems and branches curving toward substratum; paraphyllia axillary, leaf-like, minute; median leaves of well developed branches close, imbricate, complanate, distichous, thin, oblong-lanceolate to ovate, often slightly unsymmetric, concave, 1.5-2 mm. long, about 0.5 mm. wide, bases narrowed to the insertion, not decurrent, costa absent to faint, very short and double, apices gradually or abruptly narrowed to a slender or stout acumination of varying length, margins plane, serrulate nearly to base, sharply serrate above; median cells of leaves linear-flexuose, prosenchymatous, about 7 μ wide, basal cells shorter and broader, alar cells short rectangular to quadrate, not clearly differentiated, 3-6 along margin; dioicous; calyptra small, split on one side, whitish to straw colored, smooth, fugacious; sporophytes rarely seen; seta long, smooth; capsule cernuous; operculum conic-convex; urn oval-oblong, arcuate, slightly plicate when dry and empty and contracted below mouth; annulus none; peristome hypnaceous, perfect, cilia 2-3, unequal approximate length of segments; spores mature in autumn.

Habitat: On bark, decaying wood, humus soil, and stones, in moist, shaded places.

Illinois distribution: Clark, Coles, Fulton, Menard, Peoria, and Shelby Counties.

Plagiothecium deplanatum (Sull.) Grout.

Fig. A - Leaf - 40 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

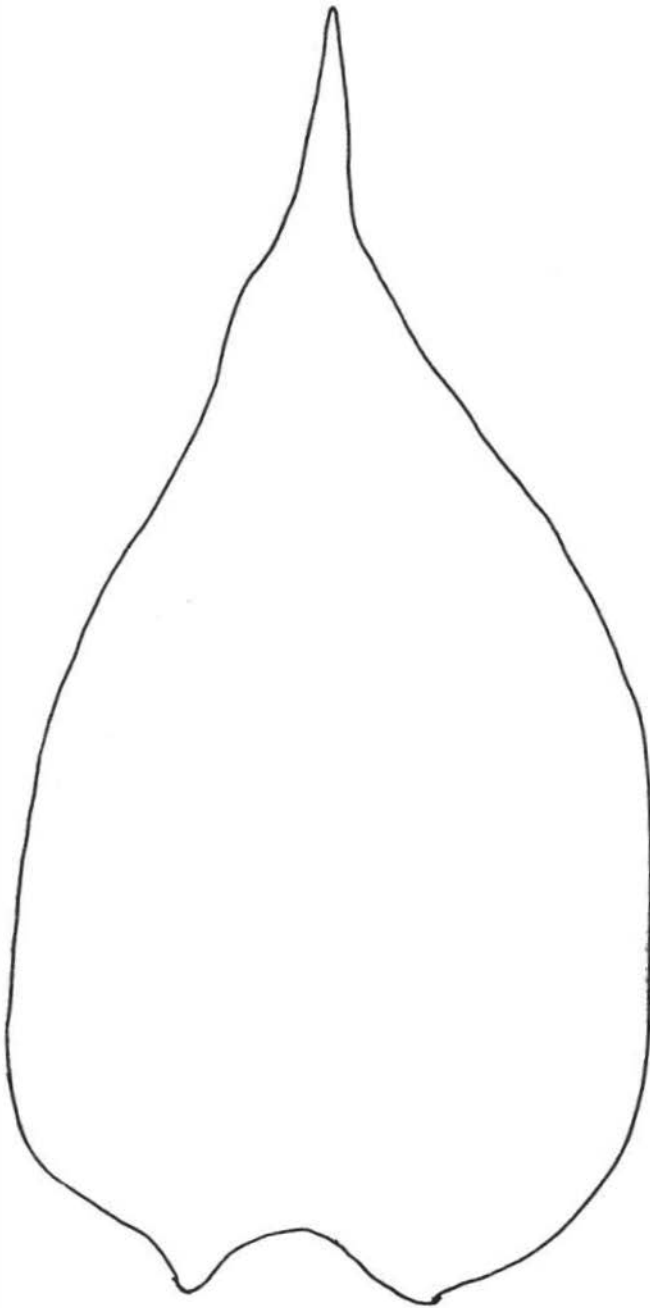


FIG. A



FIG. B



FIG. C

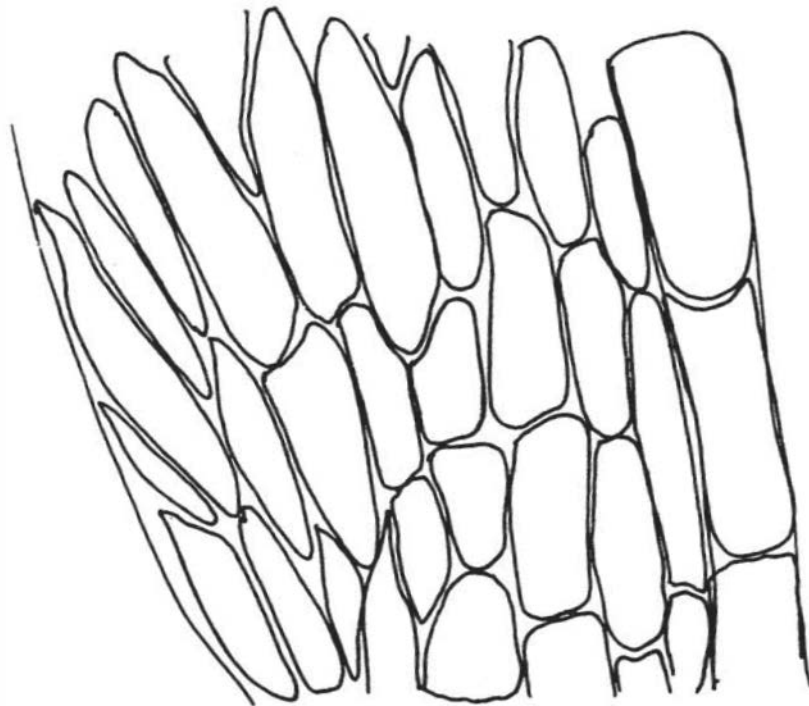


FIG. D

FAMILY: HYPNACEAE

Plagiothecium geophilum (Aust.) Grout

Plants in thin, soft, mats, yellowish to dark green, very glossy; stems prostrate, 5 cm. or more long, irregularly divided, foliated stems and branches 2.5-3 mm. wide; paraphyllia minute, leaf-like, axillary; median leaves of well developed branches rather distant, scarcely imbricate, wide spreading, complanate, slightly distichous, ovate to oblong-lanceolate, gradually narrowed to apex, slightly concave, 1.2-1.8 mm. long, bases narrowed to insertion, not decurrent, costa none to rather distinct, short and double, apices subobtuse, obtuse, or acute, margins plane, serrulate to base, sharply serrate above; upper leaves on dorsal surface subpapillose to papillose by projections from angles of cell walls, median cells prosenchymatous, linear-flexuose, about 6 μ wide, basal cells shorter, alar cells few, short rectangular, only slightly enlarged, thick-walled, not forming distinct auricles; dioicous; calyptra small, split on one side, whitish to straw-colored, smooth, fugacious; seta reddish brown, up to 12 mm. long; capsule small, inclined, unsymmetric; operculum conic, obliquely long rostrate, shorter than urn; the urn ovoid, about 1 mm. long; annulus large, of 2 rows of cells; peristome hypnaceous, perfect, teeth 16, yellowish, segments linear, basal membrane present, cilia 2-3, approximate length of segments; spores brown, 8.5-10.2 μ in diameter, mature in spring or summer.

Habitat: On moist soil or stones, in shaded places.

Illinois distribution: Clark and Shelby Counties.

Plagiothecium geophilum (Aust.) Grout

Fig. A - Leaf - 160 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 640 X.

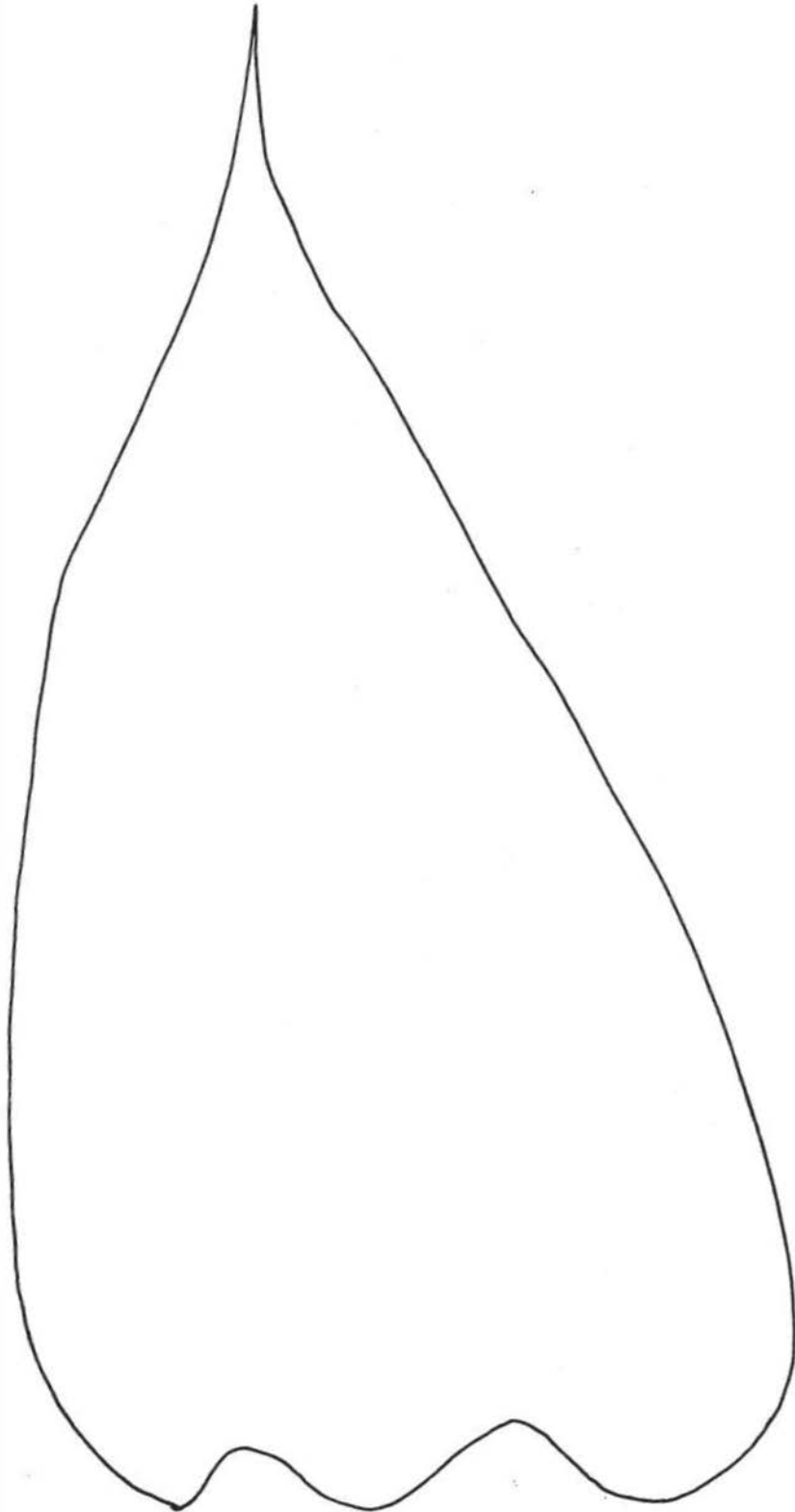


FIG. A



FIG. B



FIG. C

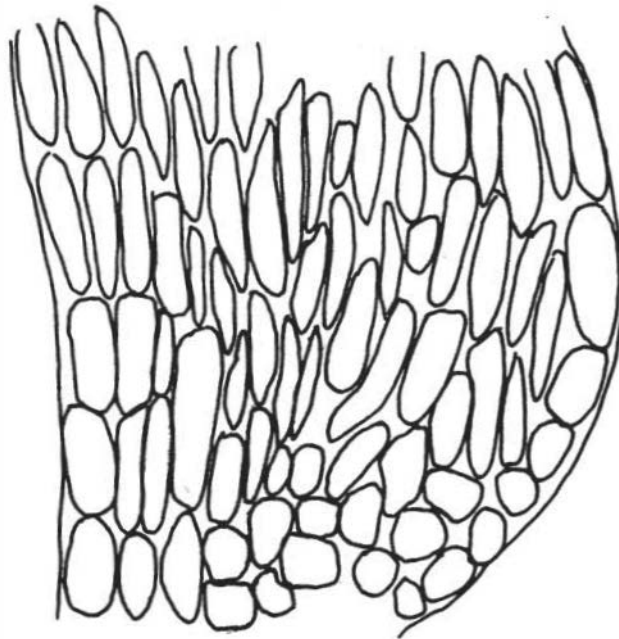


FIG. D

FAMILY: HYPNACEAE

Plagiothecium mullerianum Schimp.

Plants slender, in thin mats, yellowish green, appearing strongly flattened, very glossy; stems irregularly divided, branches 5 cm. or more long, often tapering into stolons; median leaves of well developed branches complanate, extending forward and usually curved upward near tips. ovate-lanceolate, subconcave to concave, 1.5-1.8 mm. long, up to 0.45 mm. wide, not decurrent, costa none to faint, short, and double, apices rather long, apiculate or abruptly acuminate; margins plane, entire; median cells of leaves linear, 80-100 μ long, 3-6 μ wide, basal and alar cells scarcely differentiated; dioicous; calyptra small, split on one side, whitish to straw-colored, smooth, fugacious; seta chestnut brown, rather short, 5-15 mm. long; capsule reddish yellow to brown, erect to slightly inclined, up to 2.3 mm. long; operculum conic-rostrate, about 0.8 mm. long, at least 1/2 length of urn; the urn symmetric, obovoid, with long neck, campanulate and pale brown when dry and empty, and contracted beneath mouth, 0.7-1.5 mm. long, about 0.5 mm. in diameter; annulus of 1-2 rows of cells; peristome perfect, teeth yellowish, 16, with moderately distant articulations, 0.33-0.4 mm. long, apices papillose, inner peristome pale, finely papillose, basal membrane up to 0.14 mm. high, segments not split, cilia 2, short, unequal, fugacious; spores yellow, smooth, 10-14 μ in diameter, mature in autumn.

Habitat: On moist soil and rocks, especially in ravines.

Illinois distribution: Shelby County.

Plagiothecium mullerianum Schimp.

Fig. A - Leaf - 40 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

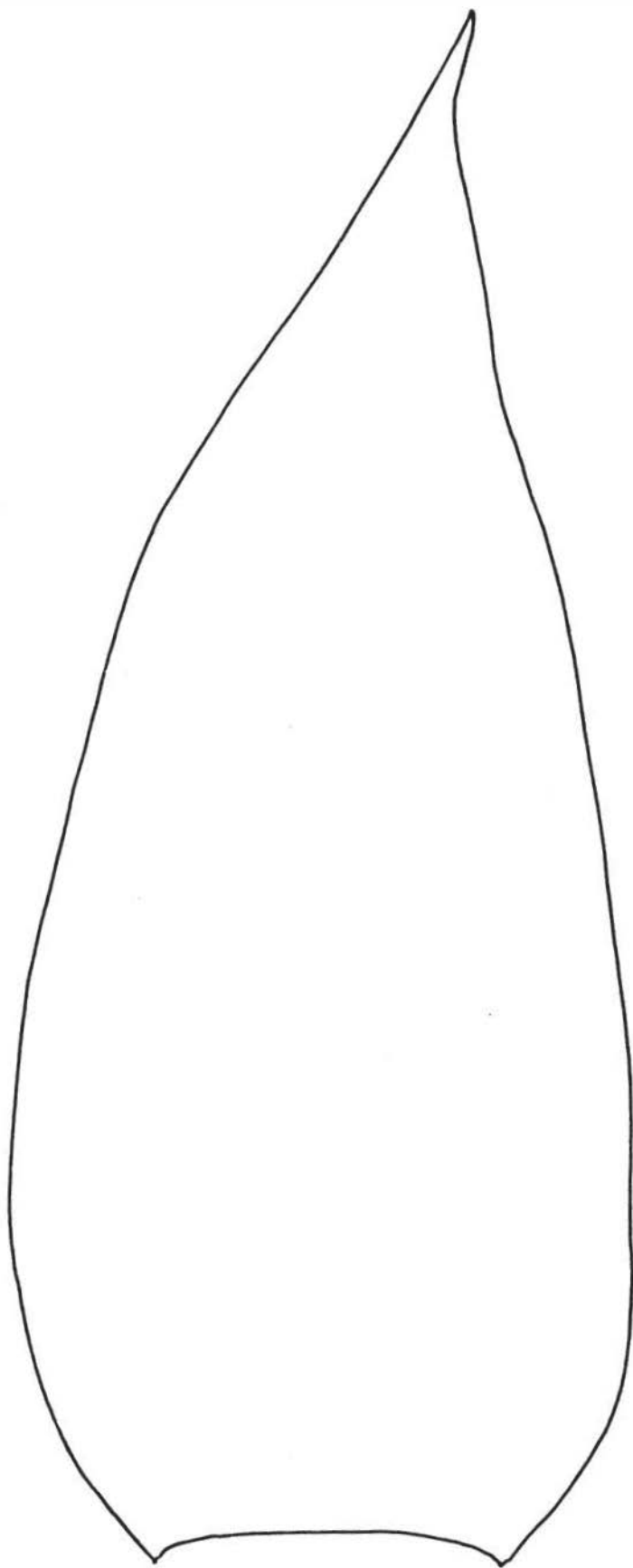


FIG. A



FIG. B

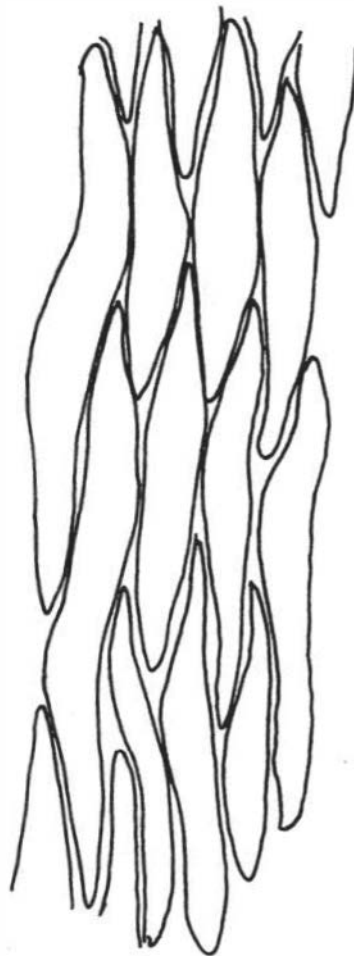


FIG. C

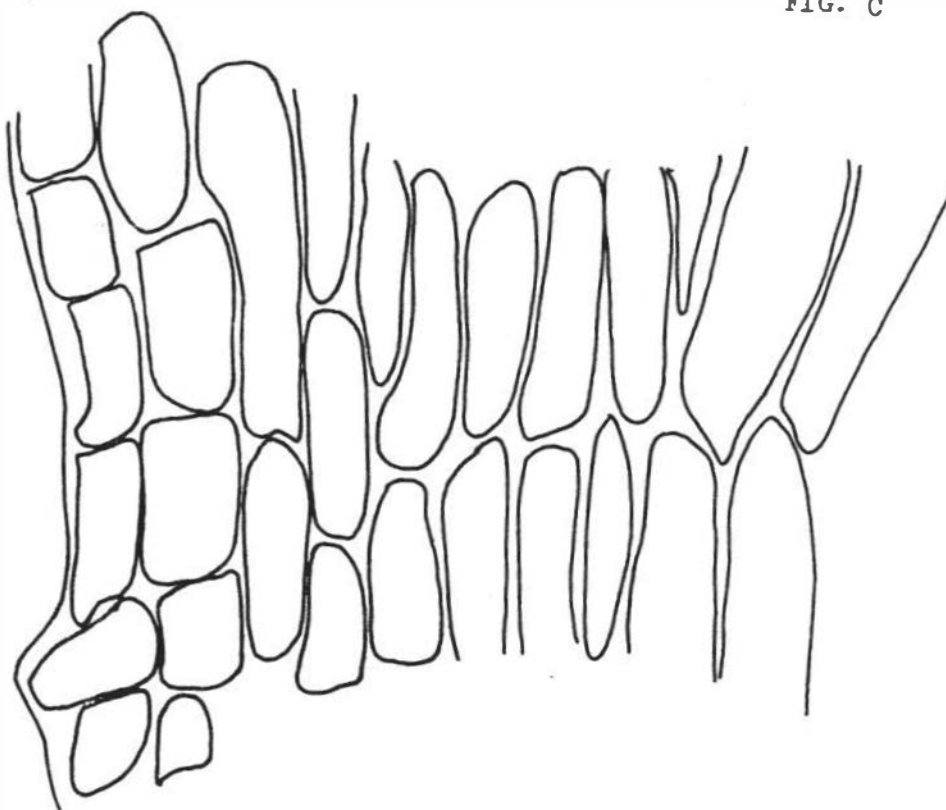


FIG. D

FAMILY: HYPNACEAE

Platygyrium repens (Brid.) B.S.G.

Plants in rather thin mats, glossy, dark green; stems prostrate, 2-6 cm. long, irregularly divided, branches short, cylindric, ascending, slightly curved; leaves imbricate when dry, erect spreading when moist, oblong-ovate, concave, decurrent, costa short, apices acuminate, margins recurved below, entire; linear-rhomboidal, alar cells numerous, quadrate, extending up margin of leaf; dioicous; calyptra cucullate, long glabrous; seta erect, chestnut brown, glossy, smooth, 1-2 cm. long; capsule erect, brown; operculum long conic, obliquely rostrate; urn chestnut brown, erect; peristome teeth 16, linear-lanceolate, with hyaline margins, raised lines at base, nearly as long as teeth, carinately split; spores minutely roughened, 12-18 μ in diameter, mature in early autumn.

Habitat: Common on bark, also soil.

Illinois distribution: Clark, Coles, Cook, Fulton, Lake, LaSalle, Menard, Peoria, Sangamon, Shelby, and Will Counties.

Platygyrium repens (Brid.) B.S.G.

Fig. A - Leaf - 160 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

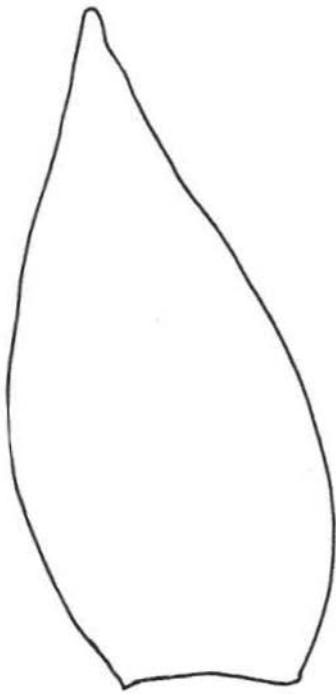


FIG. A



FIG. B

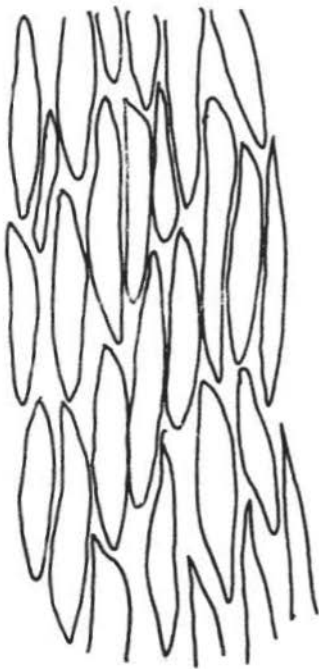


FIG. C

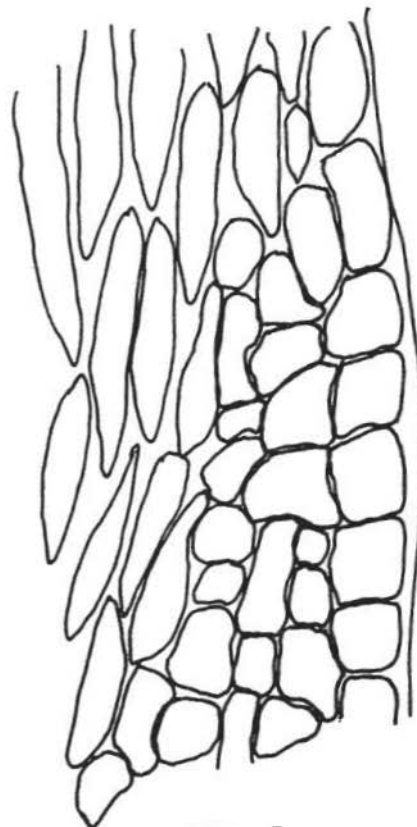


FIG. D

FAMILY: HYPNACEAE

Pylaisia selwynii Kindb.

Plants in mats, glossy, green; stems 5-8 cm. long, prostrate, pinnately divided; branches ascending, curved upward; branch leaves secund, especially at ends of branches; ovate-lanceolate, concave, subdecurrent, costa absent, apices rather long acuminate, entire; margins plane; median cells linear, 3-4 μ wide, alar cells numerous, quadrate, 15-20 along margin extending up about 1/3 blade; autiocus; calyptra cucullate; seta dark reddish brown, glossy, smooth, 12-17 mm. long; capsule reddish brown, erect, operculum conic, erect; urn ovoid, symmetric, about 2 mm. long; annulus 2-3 rows of cells; peristome teeth 16, yellowish brown, subulate-lanceolate; spores yellowish brown, minutely roughened, 18-25 μ in diameter, mature in autumn.

Habitat: On bark.

Illinois distribution: Shelby County.

Pylaisia selwynii Kindb.

Fig. A - Leaf - 160 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

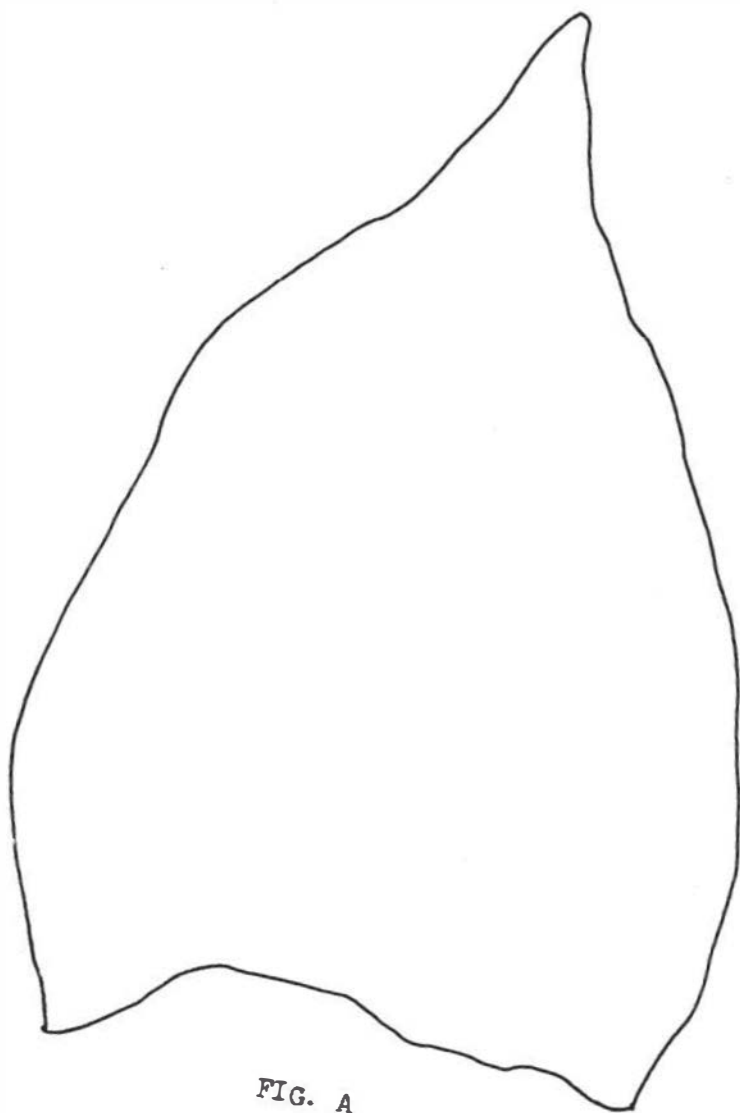


FIG. A

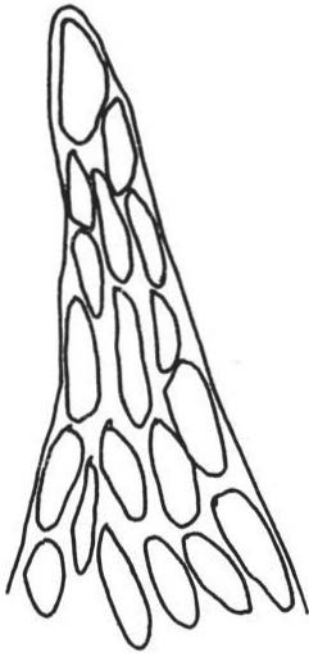


FIG. B



FIG. C

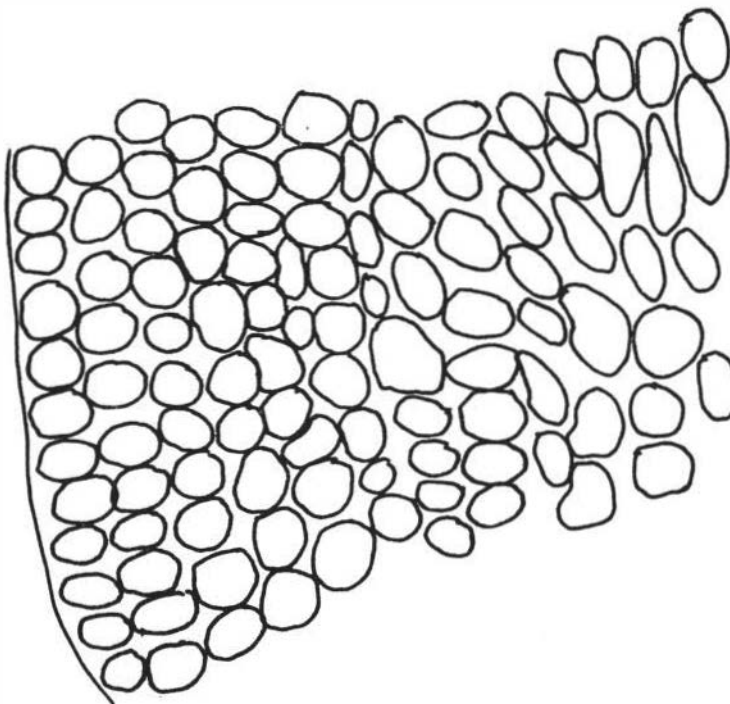


FIG. D

FAMILY: LESKEACEAE

Anomodon attenuatus (Hedw.) Hueben.

Plants slender, in loose, wide tufts, primary stems prostrate, secondary stems abundantly branching, many branches slender, leaves of stems appressed when dry, spreading when moist, broadly ovate at base, gradually narrowed to upper sublinguate portion, concave, 0.8-1.8 mm. long, bases narrowed to insertion, costa strong, pellucid, ending near apex; apices subacute, margins entire below, slightly serrulate near apiculus; median cells of leaves obscure, densely papillose on both sides, irregularly hexagonal to rounded quadrate, 6-9 μ in diameter; dioicous; calyptra cucullate; seta 1.5-2 cm. long; capsule erect; operculum long rostrate, 1/2 length of urn; urn 2-3 mm. long, 0.6 mm. in diameter, with stomata; annulus lacking; peristome double, teeth 16, yellow, narrowly lanceolate, 0.4 mm. long segments of inner peristome yellowish, filiform; spores greenish brown, almost smooth, 7-9 μ in diameter, mature in autumn.

Habitat: On rocks, bases of trees and stumps, in woods.

Illinois distribution: Champaign, Christian, Clark, Coles, Cook, Fulton, Lake, LaSalle, Marion, Menard, Peoria, Pope, Richland, Saline, and Shelby Counties.

Anomodon attenuatus (Hedw.) Hueben.

Fig. A - Leaf - 104 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 640 X.

Fig. D - Alar cells - 400 X.

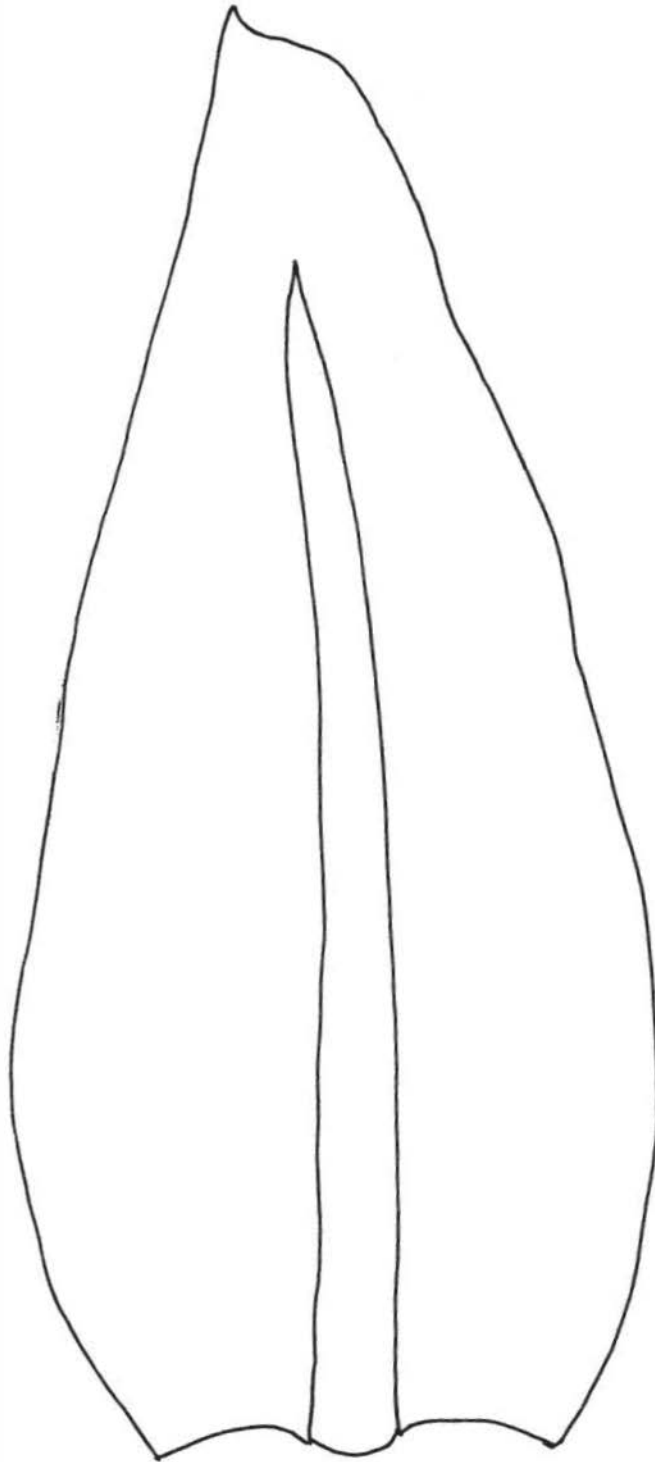


FIG. A

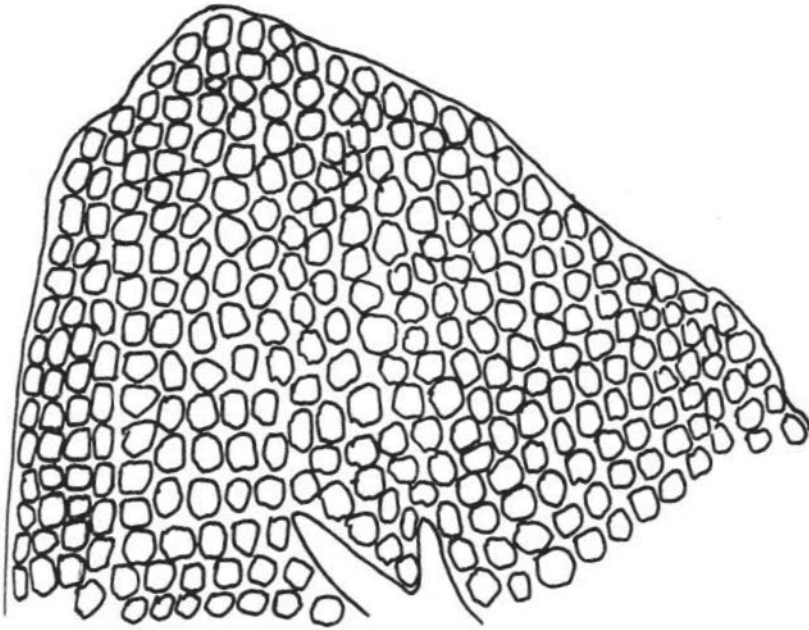


FIG. B

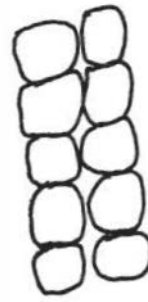


FIG. C

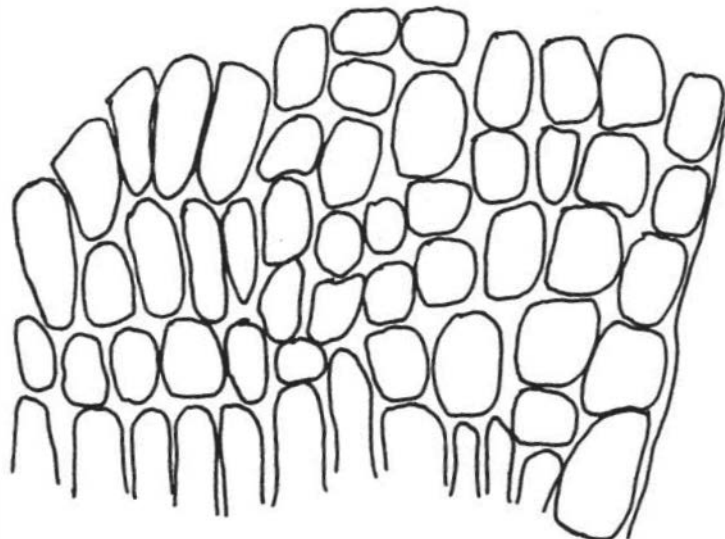


FIG. D

FAMILY: LESKEACEAE

Anomodon minor (Beauv.) Lindb.

Plants in loose mats, glaucous green above, brownish below; primary stems prostrate, flagellate, secondary stems erect or nearly so, up to 4 cm. long, foiliated stems and branches slightly flattened; leaves of secondary stems somewhat 2-ranked, appressed when dry, spreading when moist, broadly lingulate from a broadly ovate base, opaque, concave at base, up to 2 mm. long, slightly decurrent, costa strong, pellucid, disappearing below apex, apices rounded obtuse, margins entire; majority of cells of leaves densely papillose on both surfaces, papillae small, median cells rounded hexagonal, 9-12 μ in diameter, basal median cells elongate usually not papillose; dioicous; calyptra cucullate, extending to middle of urn or farther; seta erect, about 1 cm. long; capsule erect, symmetric, 2-3 mm. long; operculum conic, acuminate, about 2/5 length of urn; the urn chestnut brown in color, oblong-cylindric, about 2.4 mm. long and 0.9 mm. in diameter, without stomata, mouth small, about 0.3 mm. in diameter; annulus of 2 rows of cells; peristome teeth 16, narrowly linear-lanceolate, about 0.32 mm. long, hyaline, faintly papillose, segments of inner peristome very short to rudimentary to none, from a very narrow basal membrane, cilia none; spores brownish, papillose, 9-13 μ in diameter, mature in late autumn or winter.

Habitat: Usually at base of trees, occasionally on rocks; in woods.

Illinois distribution: Champaign, Clark, Coles, Cook, Fulton, Johnson, Menard, Peoria, Pope, Shelby, and Will Counties.

Anomodon minor (Beauv.) Lindb.

Fig. A - Leaf - 40 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

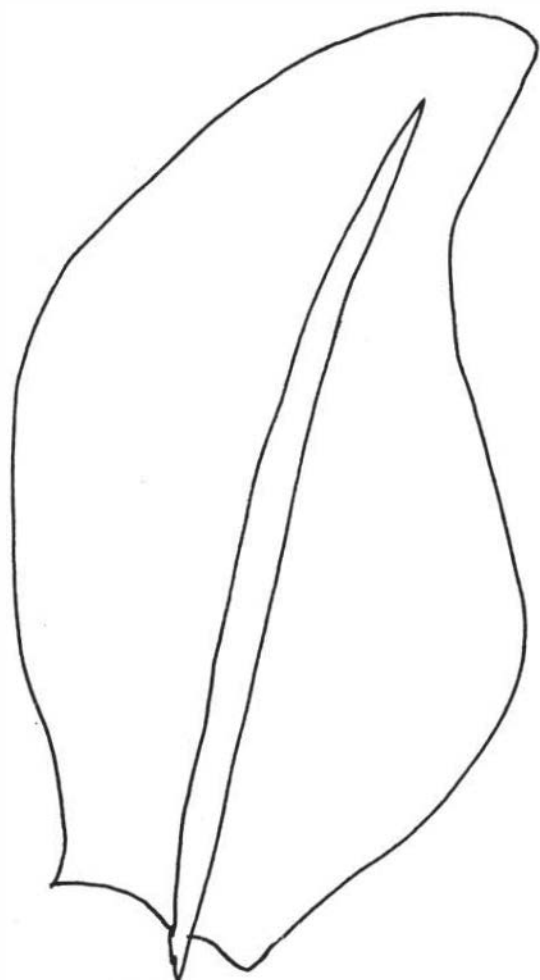


FIG. A

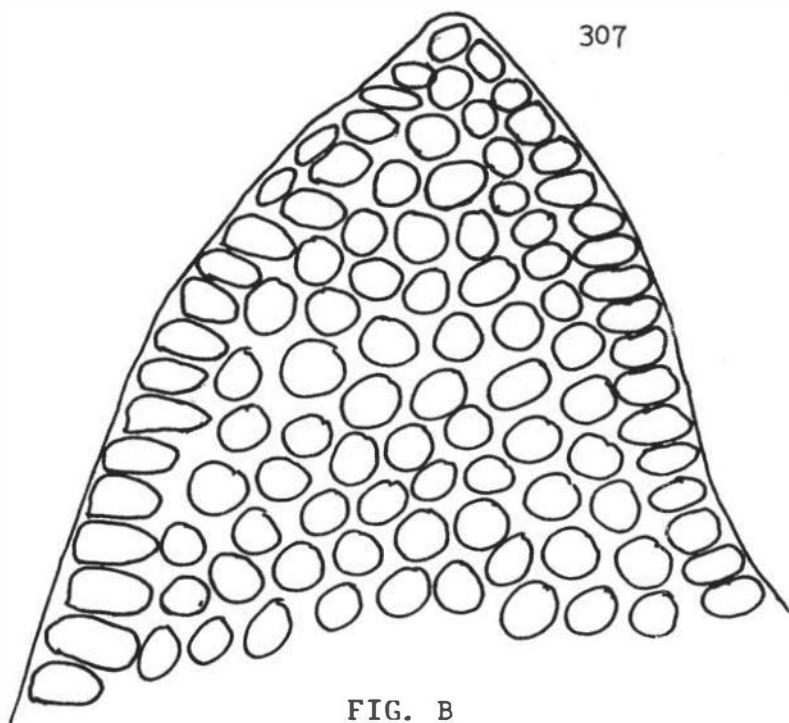


FIG. B

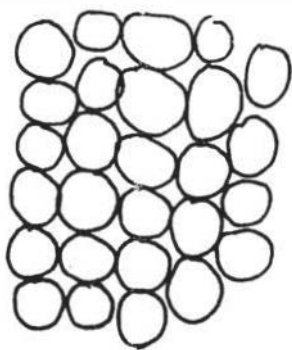


FIG. C

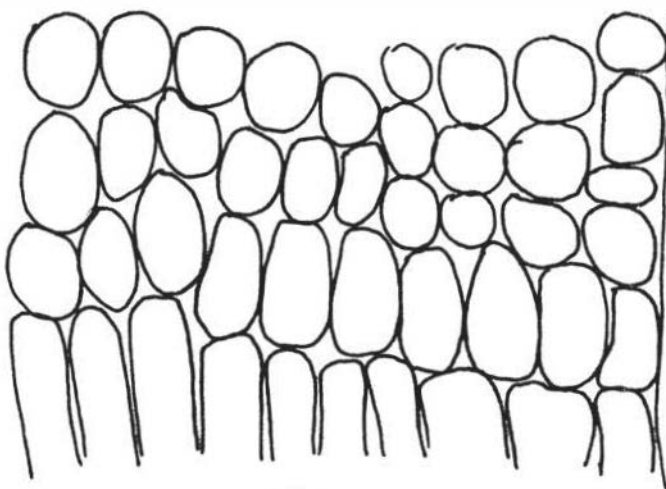


FIG. D

FAMILY: LESKEACEAE

Anomodon rostratus (Hedw.) Schimp.

Plants slender, in dense mats, yellowish green, primary stems slender, up to 4 mm. long, slender, julaceous; leaves densely imbricate, lanceolate from an ovate base, concave, 0.75-0.9 mm. long, distinct costa extending almost to the apex, apices acuminate, hyaline, smooth, margins frequently recurved, crenulate-papillose; median cells of leaves rounded, opaque, papillose with several papillae on each surface, 8-10 μ wide, median basal cells elongated, smooth to slightly papillose; dioicous; calyptra cucullate; seta erect, 6-10 mm. long, castaneous; capsule erect, symmetrical, chestnut-brown; operculum obliquely rostrate; annulus present, peristome teeth 16, linear-lanceolate, about 0.22 mm. long, papillose, segments of inner peristome linear, about as long as teeth, spores brownish, nearly smooth, 7-10 μ in diameter, mature in autumn.

Habitat: On bases of trees and on rocks, in moist places.

Illinois distribution: Champaign, Clark, Coles, Cook, Effingham, Fulton, Johnson, Lake, LaSalle, Macon, Menard, Peoria, Sangamon, Shelby, Union, and Will Counties.

Anomodon rostratus (Hedw.) Schimp.

Fig. A - Leaf - 160 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

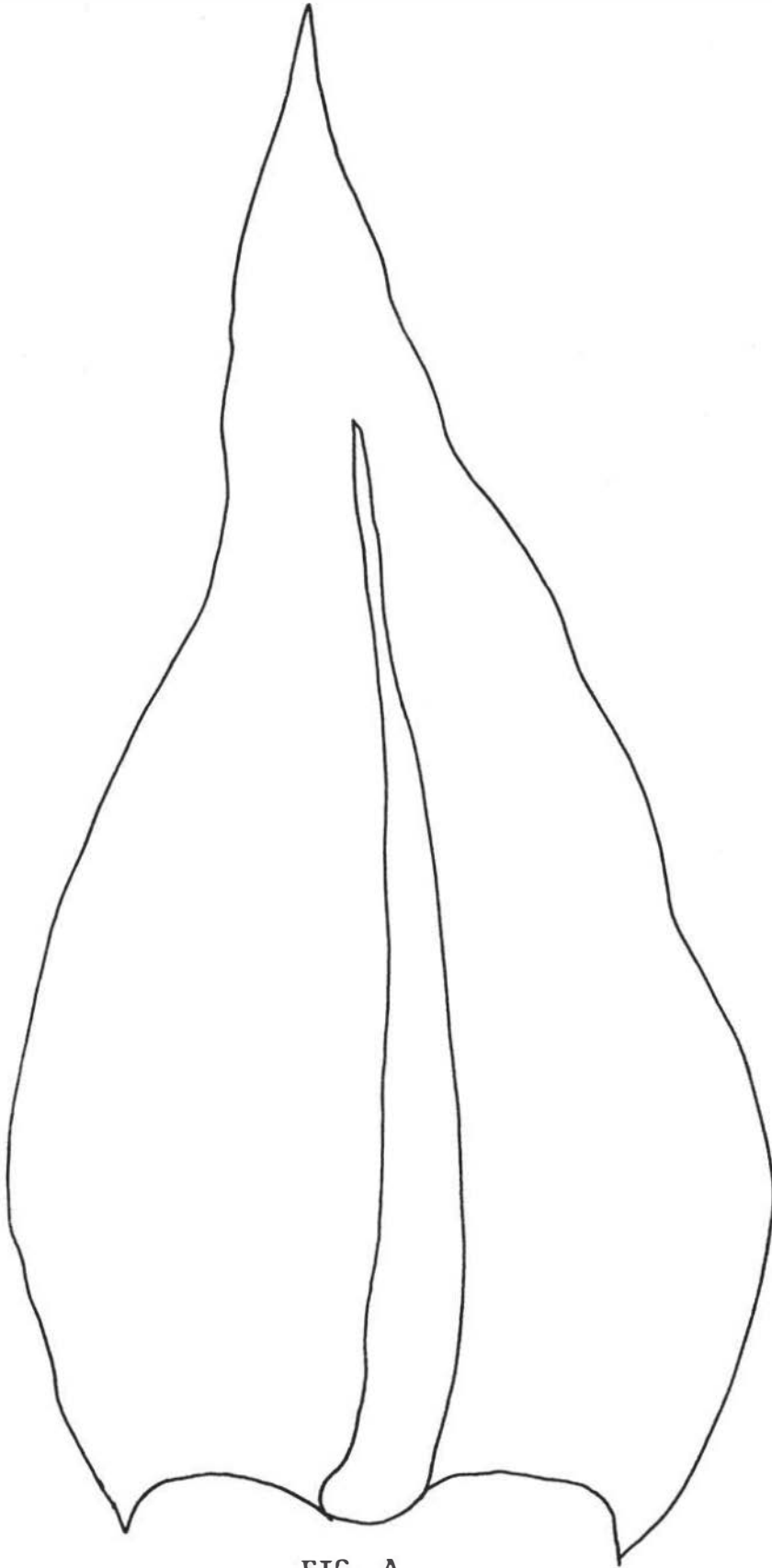


FIG. A

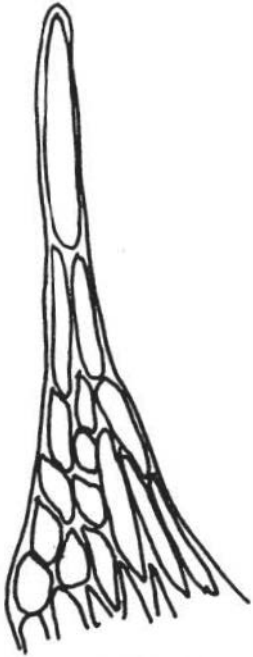


FIG. B



FIG. C

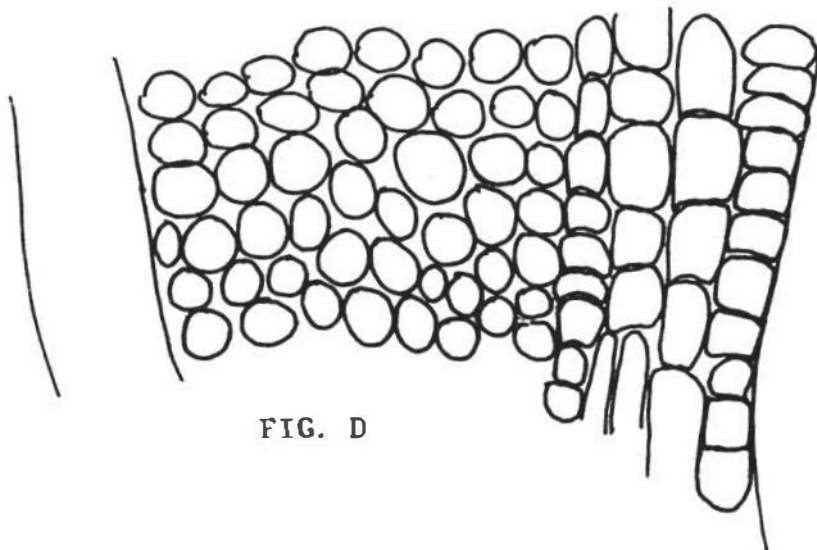


FIG. D

FAMILY: LESKEACEAE

Leskea gracilescens Hedw.

Plants in thin mats, dark green, brown below, stems prostrate, up to 4 cm. long, pinnately divided, branches numerous, simple, erect, paraphyllia few, leaves of stem appressed-imbricate when dry, erect-spreading when moist, ovate, straight, symmetric, costa subpercurrent, apices acute, margins entire, cells of leaves unipapillate on lower surface, usually smooth on upper, median cells quadrate-hexagonal, 8-10 μ wide, alar and basal cells quadrate; autoicous; calyptra cucullate; seta red, 8-10 mm. long; capsule erect, reddish; operculum conic, obtuse; urn oblong-cylindric, tapering at base; annulus of 2 rows of cells, deciduous; peristome double, teeth 16, whitish, linear-lanceolate, about 0.4 mm. long; spores smooth, 8-11 μ in diameter, mature in early summer.

Habitat: On base of trees, rotten wood, rocks, and soil.

Illinois distribution: Clark, Coles, Cook, Lake, McDonough, Saline, Shelby, and Will Counties.

Leskea gracilescens Hedw.

Fig. A - Leaf - 160 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

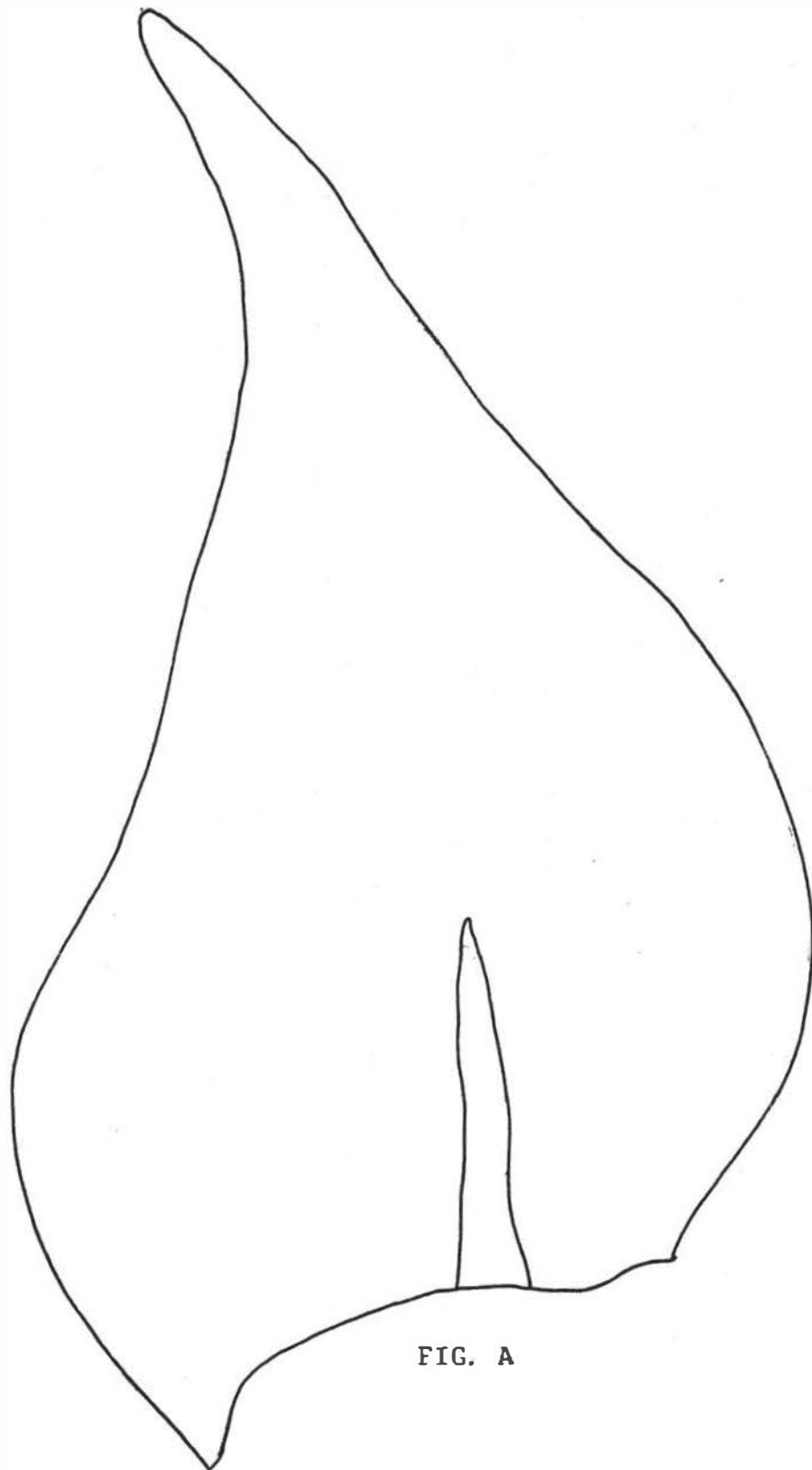


FIG. A

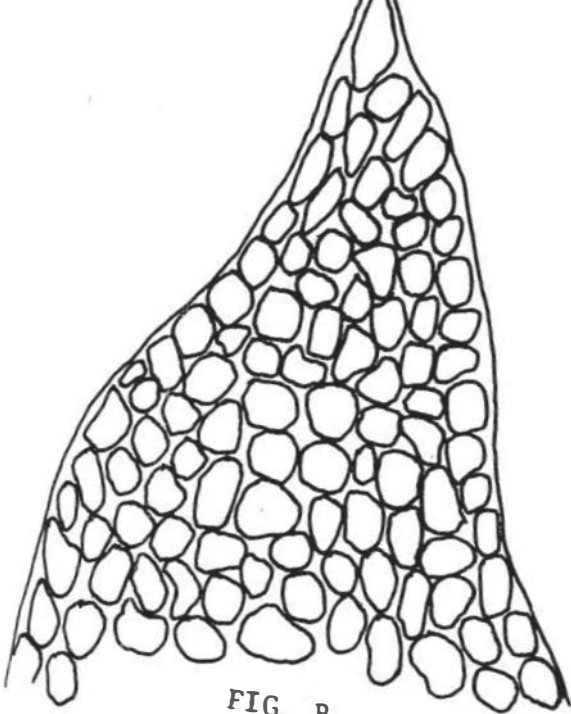


FIG. B

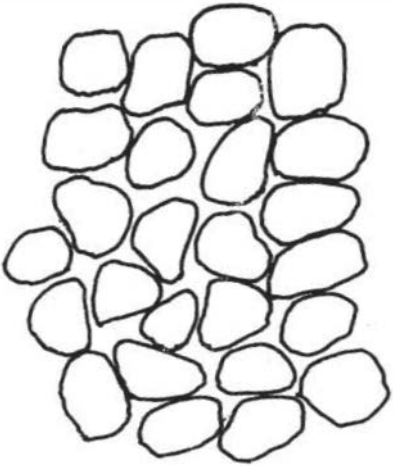


FIG. C

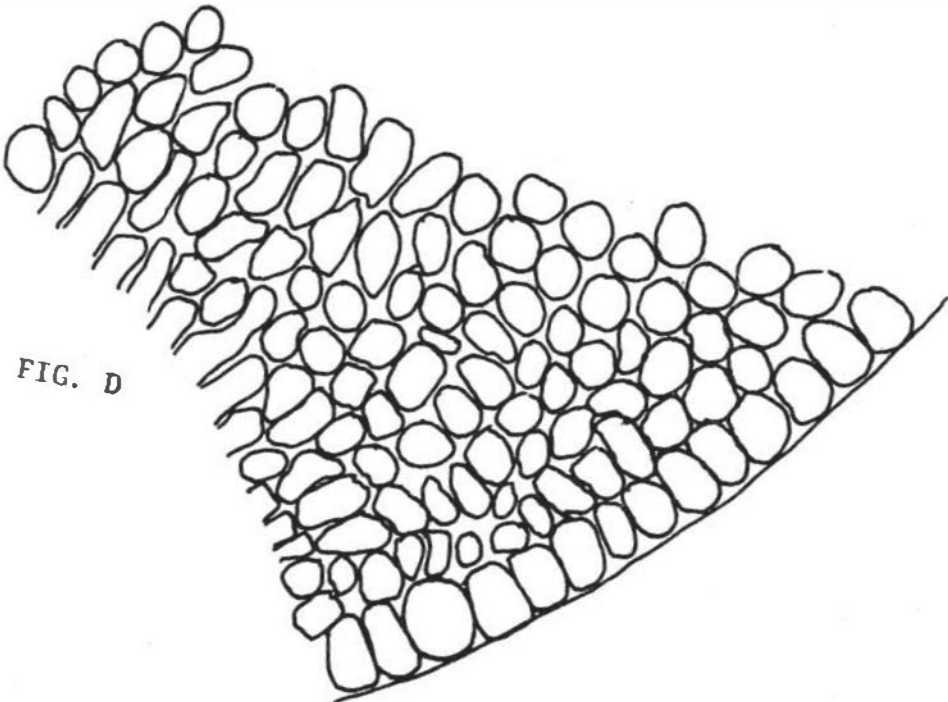


FIG. D

FAMILY: LESKEACEAE

Leskea obscura Hedw.

Plants small, in loose spreading tufts, olive green above, reddish below; stems prostrate, irregularly and sparingly divided, up to 5 cm. long; paraphyllia few to none; leaves of stems incurved, appressed when dry, spreading when moist, concave, ovate-oblong, 0.8-1.3 mm. long, 0.4-0.7 mm. wide, straight or slightly curved, asymmetric, scarcely plicate, costa ending a little below apex, apices subacute; margins plane, entire or serrulate; cells of leaves pluri-papillate on lower surface with small papillae, papillose to nearly smooth on the upper, the median cells quadrate-hexagonal, 8-10 μ wide; autoicous; calyptra cucullate; seta reddish, 1-2 cm. long; capsule erect, straight; operculum short conic, subobtuse, obtuse, or spiculate; urn yellowish, oblong-cylindric, slightly contracted below mouth when dry and empty, 1.75-2.25 mm. long, about 0.8 mm. wide; annulus of 2 rows of cells; peristome double, teeth 16, from yellowish basal membrane about 1/5 length of teeth, cilia none; spores smooth, 11-14 μ diameter, mature in early spring.

Habitat: Usually on base of trees or rotten wood, occasionally on rock or soil.

Illinois distribution: Champaign, Clark, Coles, Cook, Fulton, Johnson, Lake, Menard, Peoria, Saline, and Shelby Counties.

Leskea obscura Hedw.

Fig. A - Leaf - 160 X.

Fig. B - Apical cells - 640 X.

Fig. C - Median cells - 640 X.

Fig. D - ~~Alar~~ cells - 640 X.

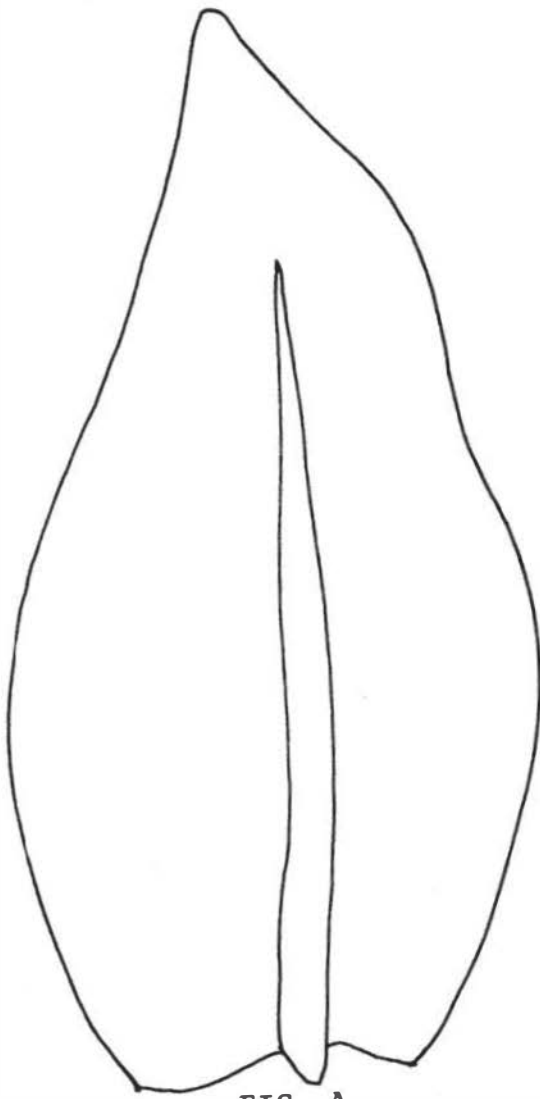


FIG. A

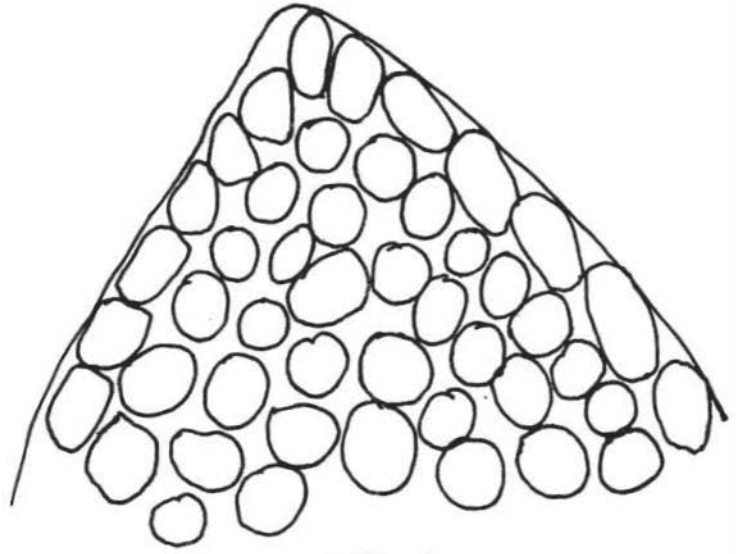


FIG. B



FIG. C

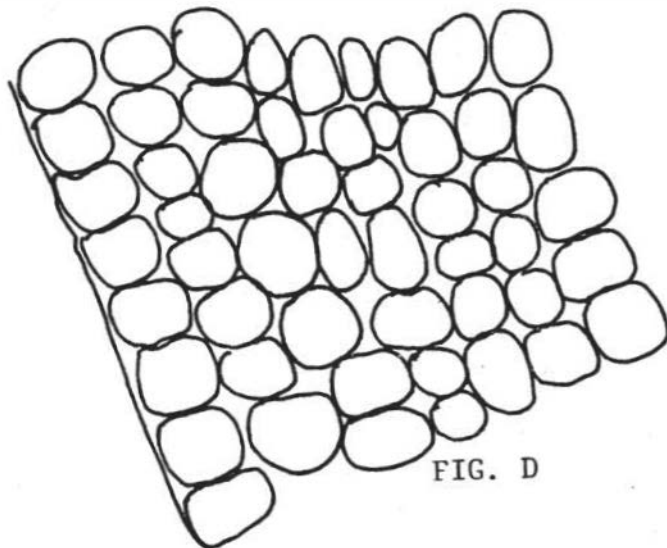


FIG. D

FAMILY: LESKEACEAE

Thelia asprella Sull.

Plants small, in densely interwoven mats, 1-2 cm. deep, glaucous green; stems prostrate, 5 cm. or more in length, irregularly divided; branches numerous, close, short, julaceous; paraphyllia present, leaves of stem broadly ovate, 0.8-1 mm. long, 0.5-0.75 mm. wide, very concave, decurrent, costa extending to the middle of leaf, apices narrowly acuminate, margins bordered throughout with long cilia, cells of leaves papillose, median cells pellucid, rhomboid, each with a 2-3 pointed papillia on lower surface, apical linear, alar cells quadrate to rectangular; dioicous; calyptra cucullate; seta red, 5-10 mm. long; capsule erect, symmetric; operculum conic; urn oblong-cylindric, 2-2.5 mm. long, about 0.5 mm. in diameter; annulus absent; peristome whitish, teeth 16, very slender, linear-lanceolate, inner peristome papillose; spores pale yellow, smooth, 12-15 μ in diameter, mature in autumn.

Habitat: On bark of trees and on stumps, in woods.

Illinois distribution: Clark, Coles, Cook, Fulton, Lake, Menard, Peoria, and Shelby Counties.

Thelia asprella Sull.

Fig. A - Leaf - 160 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

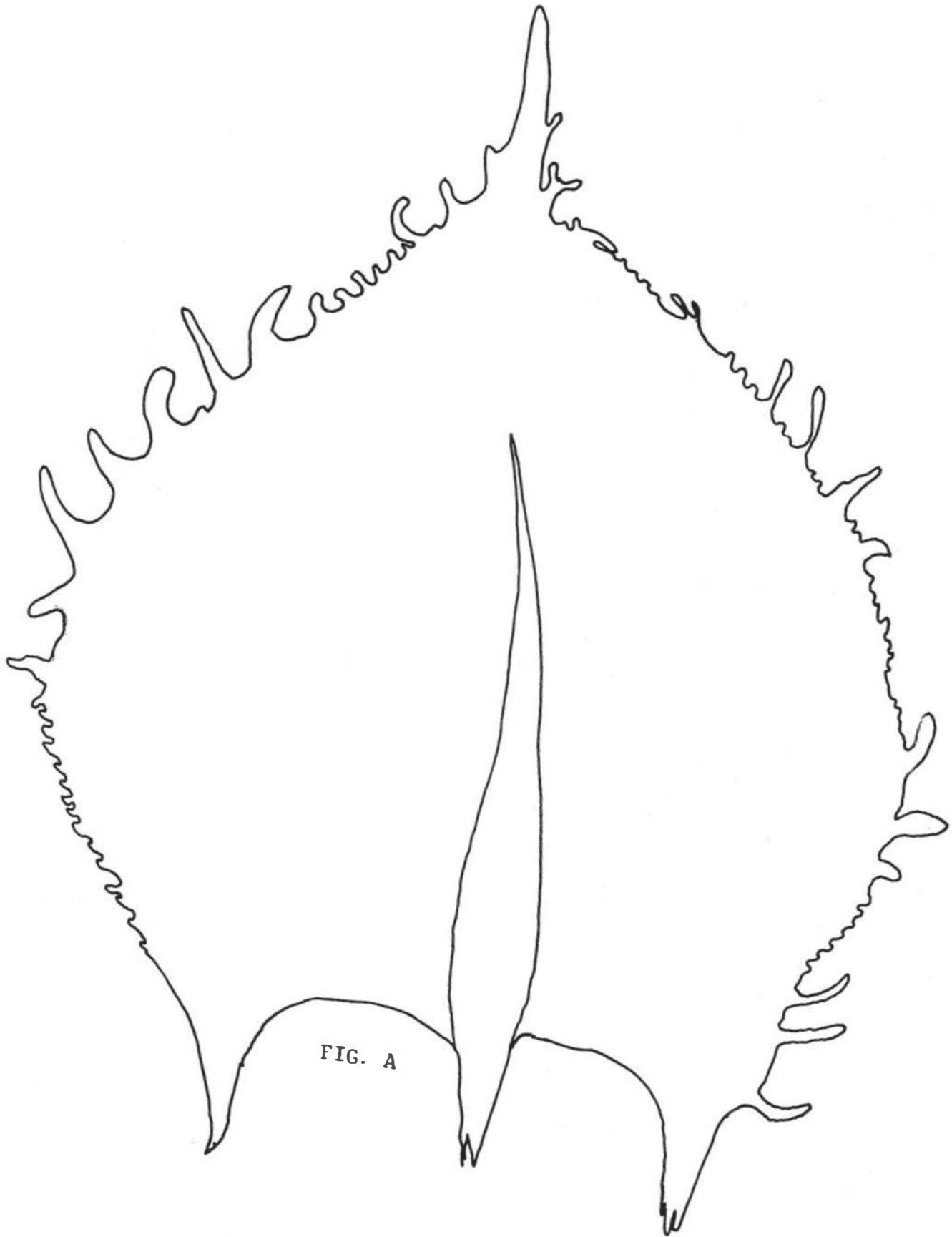




FIG. B

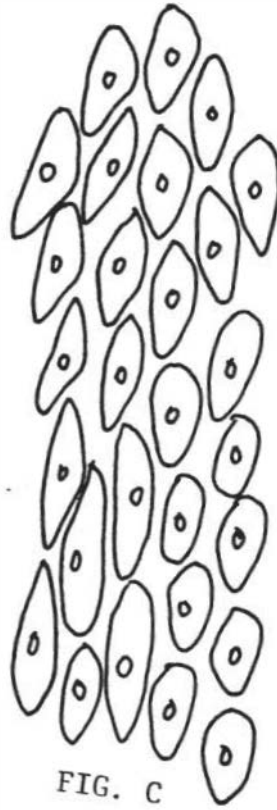


FIG. C

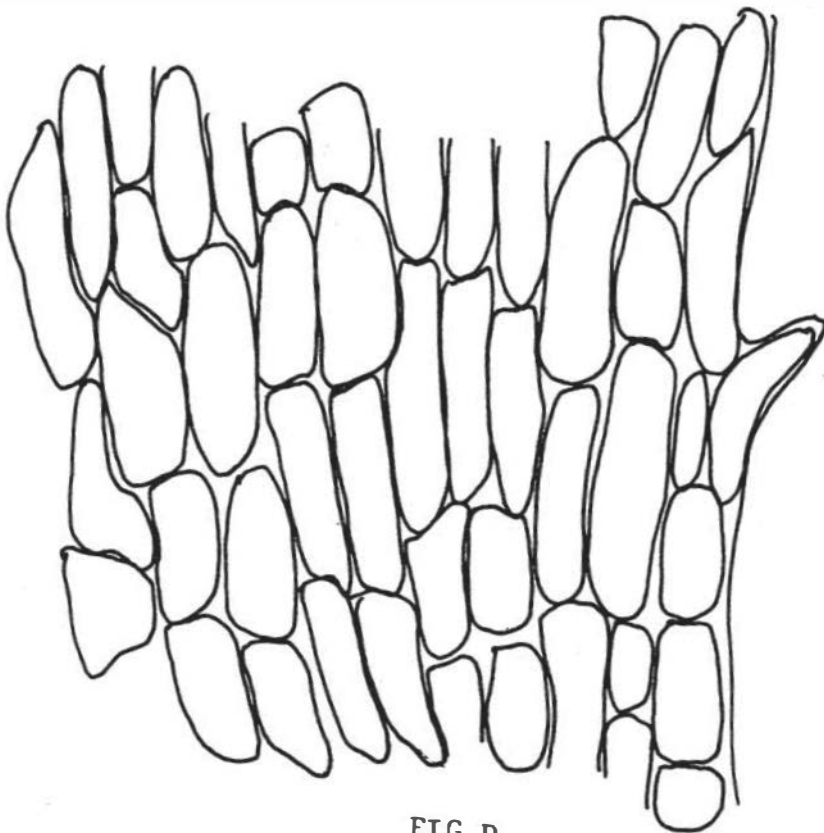


FIG. D

FAMILY: LESKEACEAE

Thuidium delacatulum (Hedw.) Mitt.

Plants large, in interwoven mats, bright green or yellowish above, darker below, stiff when dry, fern-like in appearance; stems prostrate or arched, elongate, up to 12 cm. in length, regularly, twice to thrice divided; paraphyllia very numerous, simple to branched, linear to multi-form, apical cells with 2-4 papillae, majority of lateral papillae at center of cells or approximately so; leaves of stems appressed when dry; erect-spreading when moist, furrowed, triangular-ovate, 0.8-1 mm. long, 0.75-0.9 mm. wide, subcordate at base, gradually becoming thinner toward tip of leaf, disappearing in apex of leaf, apices gradually acuminate, margins recurved, papillate-serrate; median cells of leaves oblong-quadrate, 7-8 μ wide, usually unipapillate on both sides, occasionally bipapillate, the papillae up to 6.8 μ long; leaves of branches smaller, ovate, about 0.6 mm. long and 0.3 mm. wide, acuminate, apical cells with 2-4 papillae; dioicous; inner perichaetial leaves somewhat ciliate; calyptra cucullate; seta chestnut brown, rigid, 2-3 cm. long; capsule yellowish to chestnut brown, inclined to horizontal; operculum conic-rostrate; urn curved, cylindric, 3.5-4 mm. long; annulus of 2-3 rows of cells; peristome large, teeth 16, reddish to brownish yellow, up to 0.9 mm. long, segments of inner peristome lanceolate, about as long as teeth, occasionally carinately split; spores brownish yellow, very slightly roughened, 14-18 μ in diameter, mature in late autumn or winter.

Habitat: On soil, rotten wood, and stones; in moist woods.

Illinois distribution: Clark, Coles, Cook, Fulton, Henderson, Jackson, Lake, Menard, Peoria, Sangamon, Shelby, and Union Counties.

Thuidium delacatulum (Hedw.) Mitt.

Fig. A - Leaf - 160 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 640 X.

Fig. D - Alar cells - 640 X.

Fig. E - Paraphyllium - 640 X.

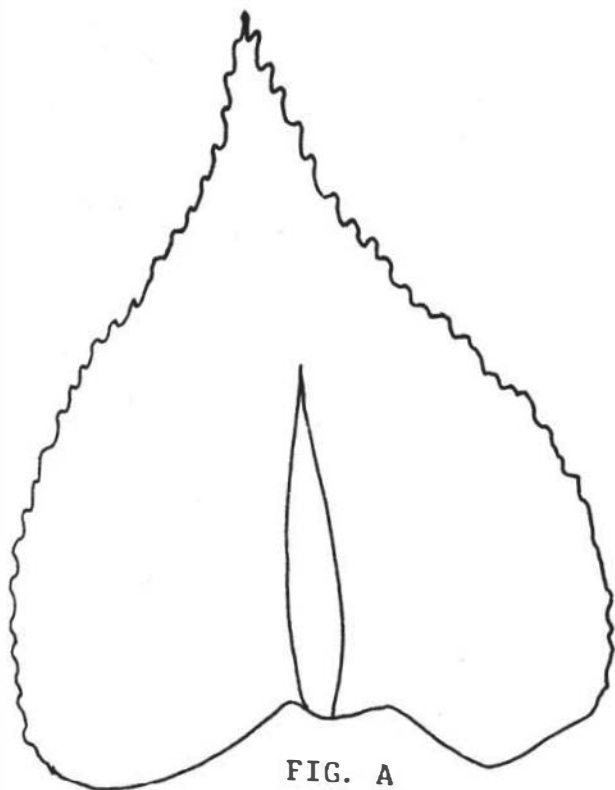


FIG. A

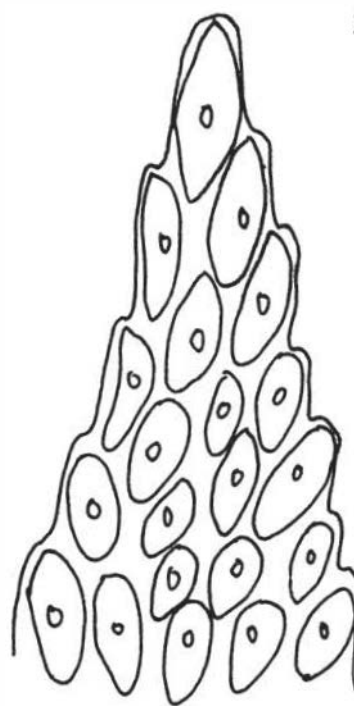


FIG. B

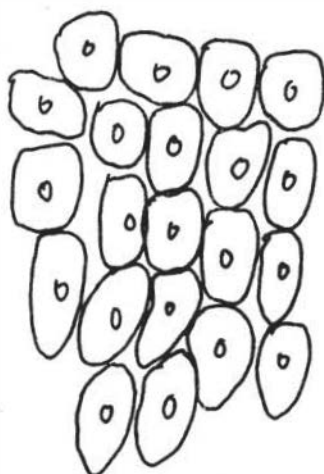


FIG. C



FIG. D

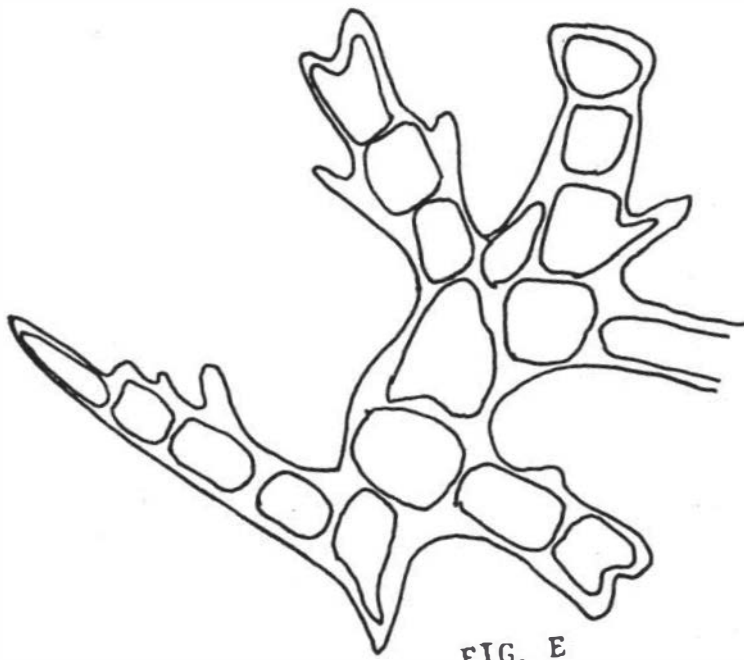


FIG. E

FAMILY: LESKEACEAE

Thuidium recognitum (Hedw.) Lindb.

Plants large, in interwoven mats, yellowish green above, darker below, stiff when dry, fern-like in appearance; stems prostrate or arched, elongate, up to 12 cm. in length, pinnately to bipinnately divided; primary branches approximately equal in length; paraphyllia very numerous, simple or branched, linear to multifid, apical cells with 2-4 papillae, majority of lateral papillae at ends of cells; leaves of stems recurved-spreading when moist, furrowed when dry, broadly triangular, 0.6-1.5 mm. long, up to 1 mm. wide, auriculate-cordate at base, costa subpercurrent to percurrent, strong throughout the blade, often filling the apex, apices abruptly acuminate, margins serrulate, usually plane; median cells of leaves oblong-rhombic to rounded-quadrate, about 9 μ wide, usually unipapillate on both surfaces, papillae on lower surfaces, papillae on lower surface often slender and curved upward; branch leaves ovate to ovate-lanceolate, up to 0.4 mm. long and 0.3 mm. wide, apical cells with 2-4 papillae; dioicous; inner perichaetial leaves not ciliate; calyptra cucullate; seta chestnut brown, 2-2.5 cm. long; capsule chestnut brown, somewhat inclined, up to 4 mm. long; operculum short rostrate, about 1.2 mm. in length; urn curved, oblong-cylindric, 2.5-3 mm. long, 0.6-0.7 mm. wide, contracted below mouth when dry and empty; annulus of 3 rows of cells; peristome large, teeth 16, brownish yellow, up to 0.9 mm. in length, segments of peristome pale, lanceolate, approximate length of teeth, occasionally carinately split, basal membrane about

1/3 height of peristome, cilia 2-3, nodose, finely papillose, spores yellowish, granular-roughened, 10-14 μ in diameter, mature in summer.

Habitat: On rotten soil, rotten wood, and rocks, in moist shaded woods, often in limestone regions.

Illinois distribution: Champaign, Clark, Coles, Cook, Johnson, Lake, LaSalle, McHenry, Shelby, and Union Counties.

Thuidium recognitum (Hedw.) Lindb.

Fig. A - Leaf - 160 X.

Fig. B - Apical cells - 640 X.

Fig. C - Median cells - 640 X.

Fig. D - Alar cells - 640 X.

Fig. E - Paraphyllum - 640 X.

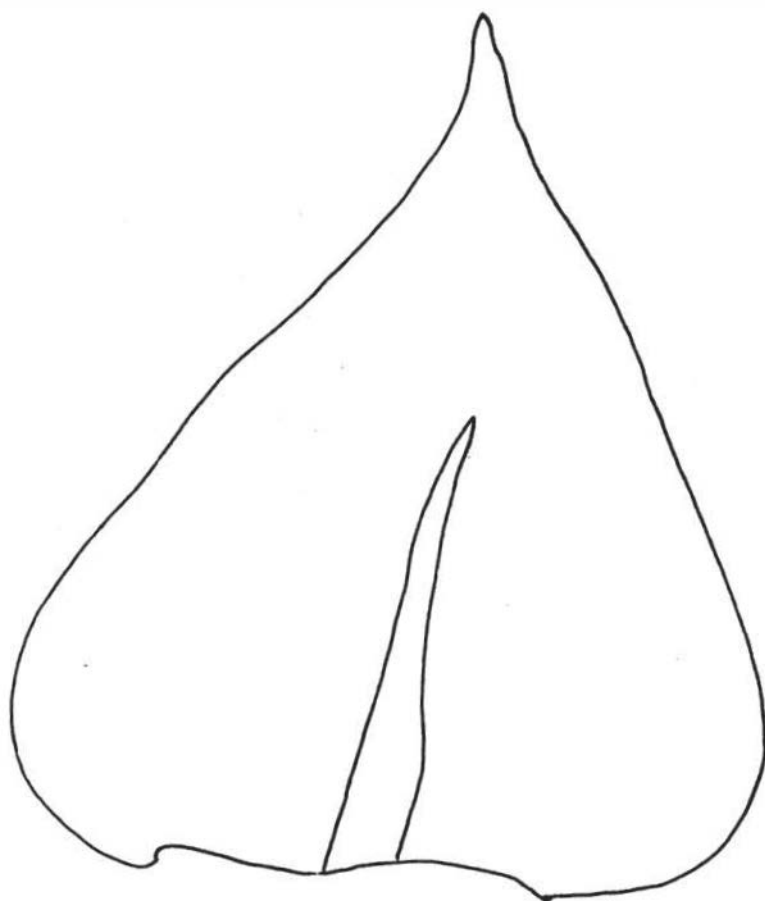


FIG. A

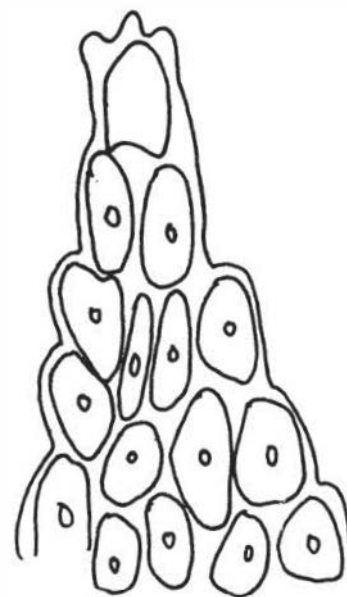


FIG. B

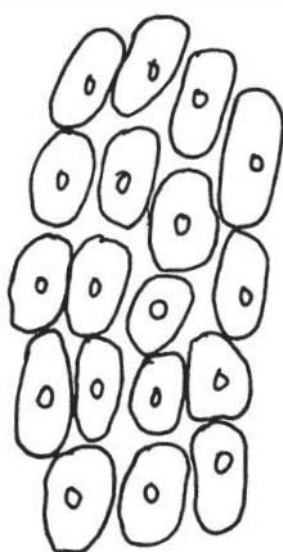


FIG. C

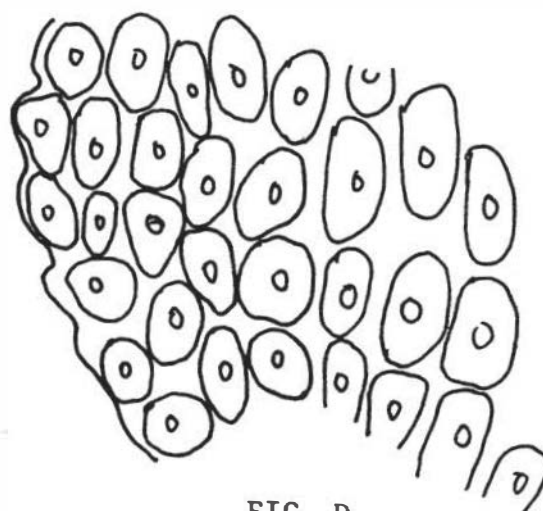


FIG. D

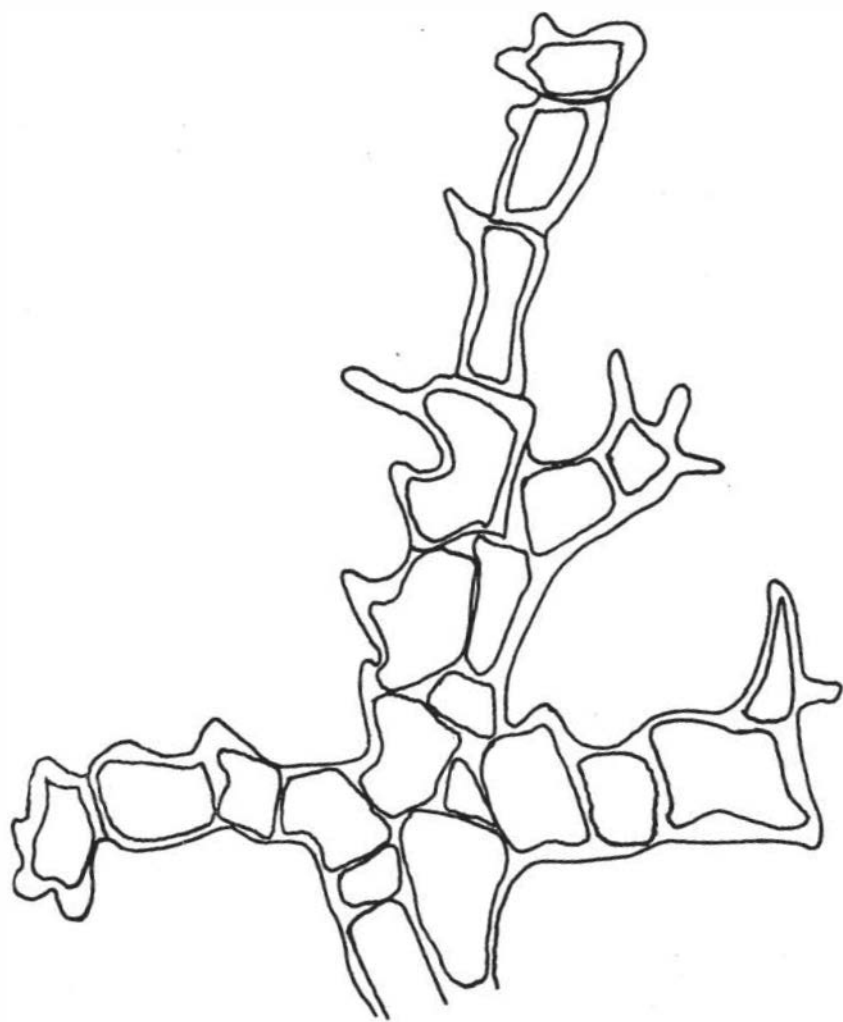


FIG. E

FAMILY: LEUCODONTACEAE

Leucodon julaceus (Hedw.) Sull.

Plants moderately robust, in loose tufts, green above, brownish below; primary stem usually 5-6 cm. long, irregularly divided, secondary stems terete-foliate, julaceous when dry, often stoloniferous at tips; leaves of secondary stems close, in many rows, appressed-imbricate when dry, scarcely plicate, not at all secund, very concave, ovate-elliptic, about 1.5 mm. in length, costa none, apices ~~mammillose~~ on lower surface, rather abruptly and briefly acuminate, margins reflexed except at apex, often incurved in apical portion, entire except serrulate at apex; cells of leaves thick-walled, smooth, median cells linear-fusiform, marginal cells rounded-hexagonal, becoming transversely oblong-hexagonal toward leaf base, basal median cells linear-sinuose; dioicous; perichaetical leaves filiform-acuminate, not extending to base beneath capsule; seta partially exserted; capsule exserted, chestnut brown; operculum conic, obliquely and briefly rostrate; urn suboval, 0.5-0.7 mm. in diameter, approximately 1 mm. long; peristome teeth 16, pale to whitish, irregular, papillose, often bifid at apex; spores pale, 25-35 μ in diameter, mature in autumn.

Habitat: On trees, in woods.

Illinois distribution: Champaign, Clark, Coles, Fulton, Johnson, Menard, Peoria, and Shelby Counties.

Leucodon julaceus (Hedw.) Sull.

Fig. A - Leaf - 40 X.

Fig. B - Apical cells - 400 X.

Fig. C - Median cells - 400 X.

Fig. D - Alar cells - 400 X.

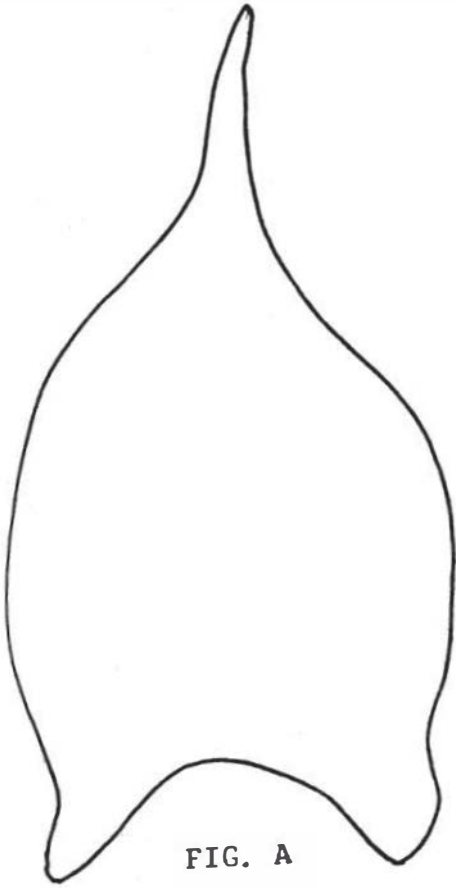


FIG. A



FIG. B

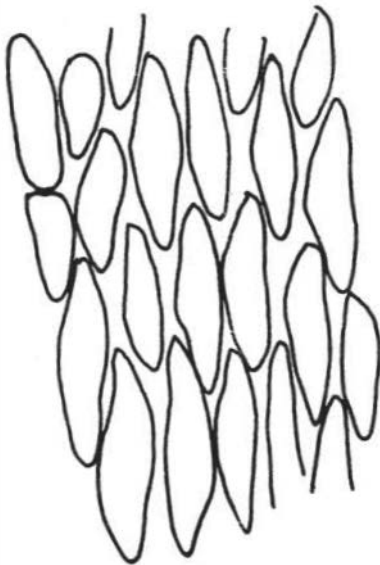


FIG. C

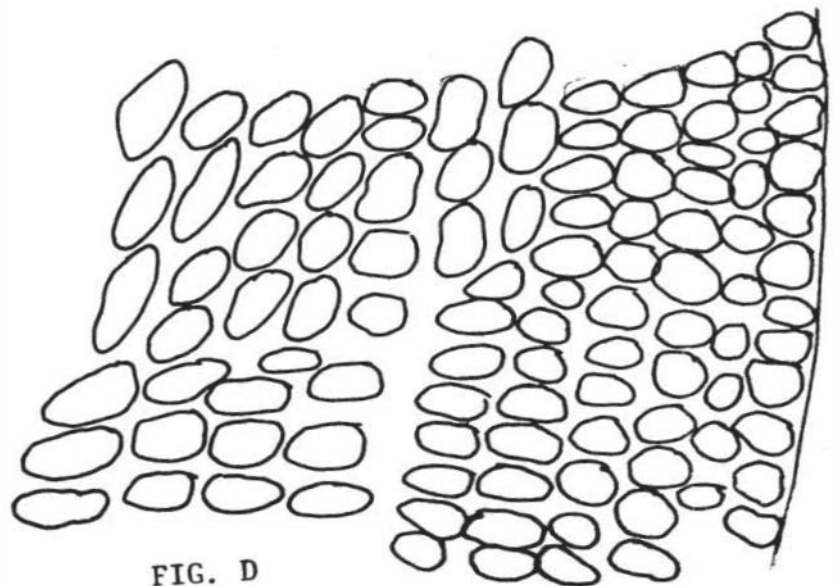


FIG. D

FAMILY: LEPIDODIACEAE

Bazzania trilobata (L.) S.F. Gray

Plants in dense tufts, bright green to olive green, younger plants light yellowish green, robust; leafy shoots 3-6 mm. wide; stems 2-10 cm. long, erect to ascending, stout, lateral branched from ventral portion of leaf axil, 5 mm. or more distance between branches, spreading at a wide angle; flagelliform branches numerous, long; in cross section of stem, the cortical and interior cells about the same in size, averaging about 20 μ ; in longitudinal section the end walls thin, lateral walls uniformly thickened except for pits, interior cells about 170 μ long, cortical cells shorter; rhizoids usually present only on leaves of flagelliform branches and on female bracts but occasionally on underleaves; leaves incubous, downward curvature in posterior half of insertion, not decurrent, on normal branches contiguous in imbricate, widely and horizontally spreading, simply 3-toothed or barely 3-lobed at tip. ovate, up to 3 mm. long and 1.5 mm. wide, unsymmetric, plane or slightly convex, deflexed when dry, apex truncate or somewhat rounded in general form; margins entire to slightly concave from base, dorsal margin strongly curved from an auriculate base which reaches over 1/2 width of stem, teeth or lobes triangular, 5-8 cells long, acute to obtuse or rounded; sinuses acute to rounded; leaves of flagelliform branches ovate-lanceolate, 200-300 μ long, mostly entire to crenulate; cells of midleaf 28-32 μ , of margin and apex 21-27 μ , basal cells smaller; walls thin; trigones large to bulging; underleaves present throughout, distant to subimbricate,

squarrose, larger underleaves broadly quadrate-orbicular, averaging 0.8-1 mm. long and about 1.4 mm. wide; apex 4-5 lobed for $1/5-1.4$ the length; margins and lobes sharply denticulate to crenulate; lobes acute to truncate; sinuses acute to rounded; plants unisexual; female and male inflorescences on special branches arising in axils of underleaves; male branches several on a stem, spicate; male bracts mostly about 1 mm. long and 800 μ wide, strongly convex, with 2-4 sharp teeth at apex, margins also sometimes toothed; male bracteole round-quadrate, mostly 400 μ long and 570 μ wide, convex, 2-3 lobed; antheridium 1; female branches, to several on a stem, the bracts and bracteoles nearly the same; female bracts oblanceolate, composed of elongate thin-walled cells, usually about 2.2 mm. long and 750 μ wide, margins lancinate-convex, with apex split into 2-4 long slender lancinae with ciliate margins; female bracteole very like male bracts; perianth up to 6 mm. long, ovoid-cylindric, contracted at mouth; mouth 3-lobed; lobes short, widely rounded, dentate to shortly ciliate, cells near mouth rectangular, about 39 μ long and 18 μ wide, near base short and small; seta in cross section of 16 large epidermal cells and 50 smaller interior ones; sporangium oblong-ovoid, its wall 5 cells thick; epidermal and intermediate layers apparently with nodular thickenings; innermost layer with semi-annular thickenings; elaters about 200 μ long and 12 μ wide, tapering slightly at ends; spirals 2, brown; spores 12-15 μ .

Habitat: On earth, rocks, and decaying wood; in forests and swamps.

Illinois distribution: Clark, Jackson, Pope, Shelby, and Union Counties.

Bazzania trilobata (L.) S.F. Gray

Fig. A - Dorsal view - 16 X.

Fig. B - Leaf cells - 400 X.

Fig. C - Ventral view - 16 X.

Fig. D - Underleaf - 26.5 X.

Fig. E - Leaf - 26.5 X.

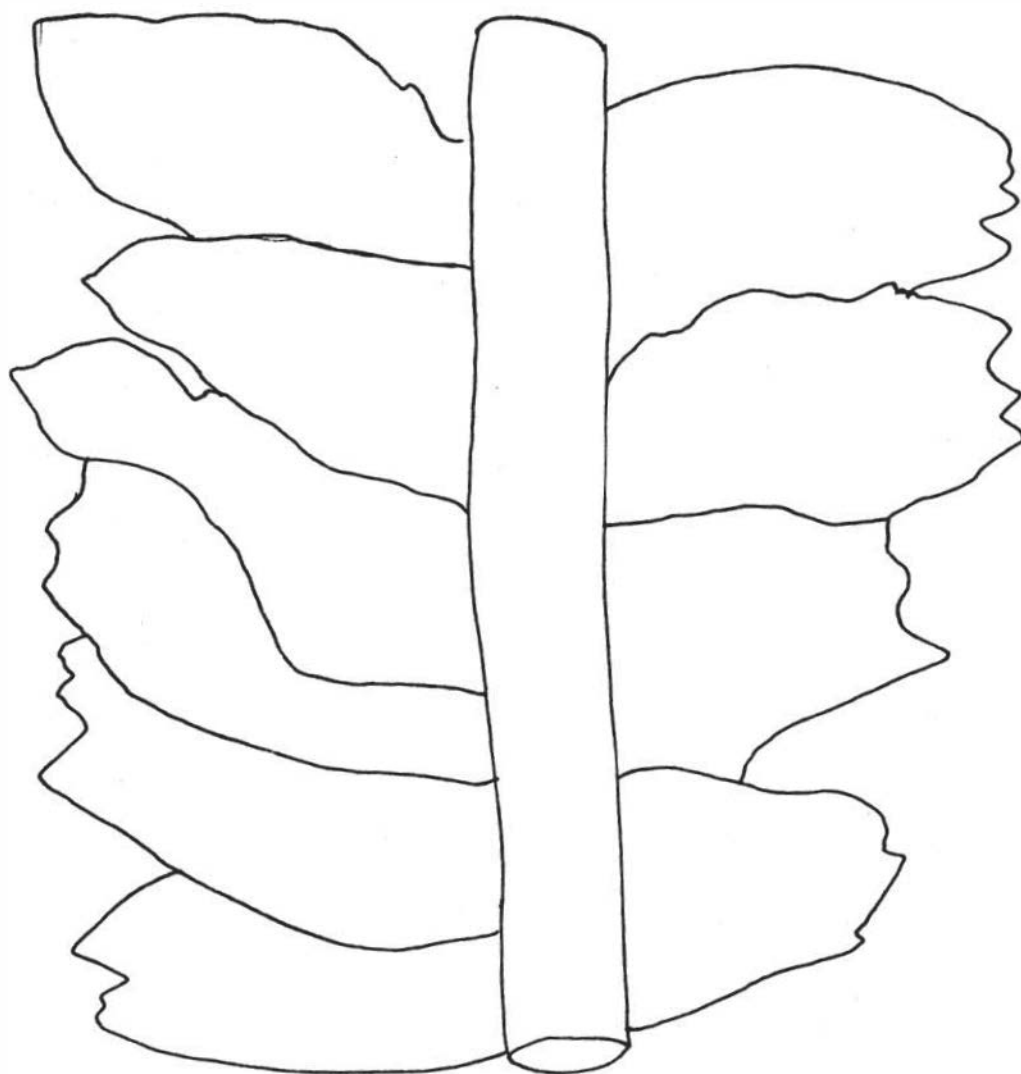


FIG. A

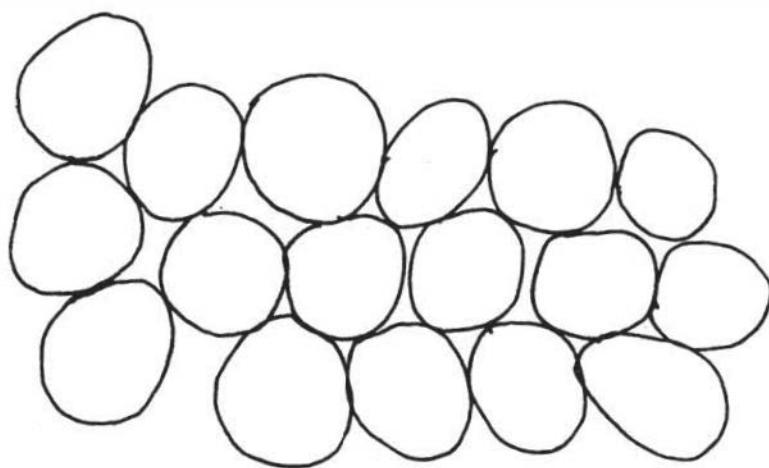


FIG. B

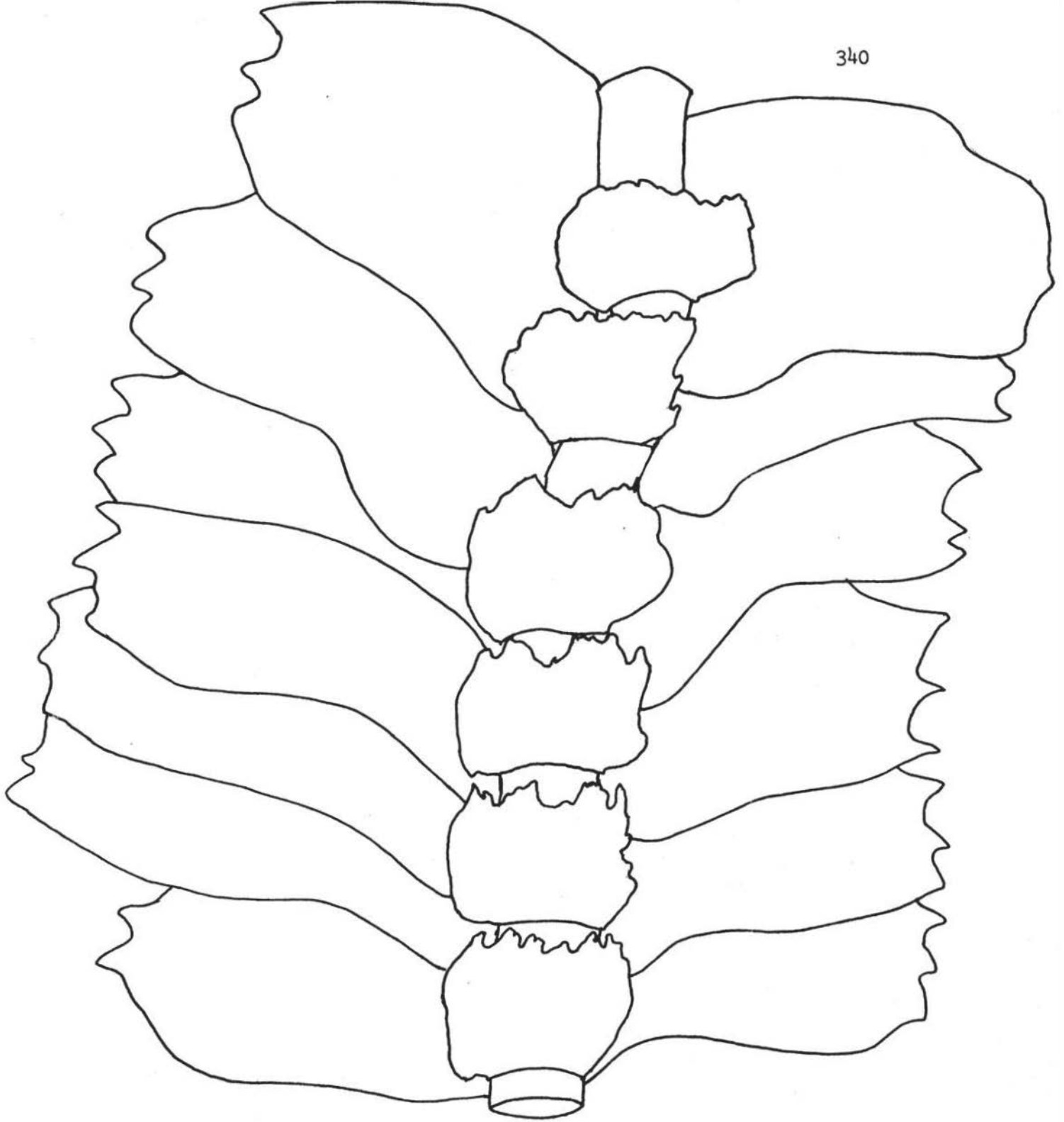


FIG. C



FIG. D

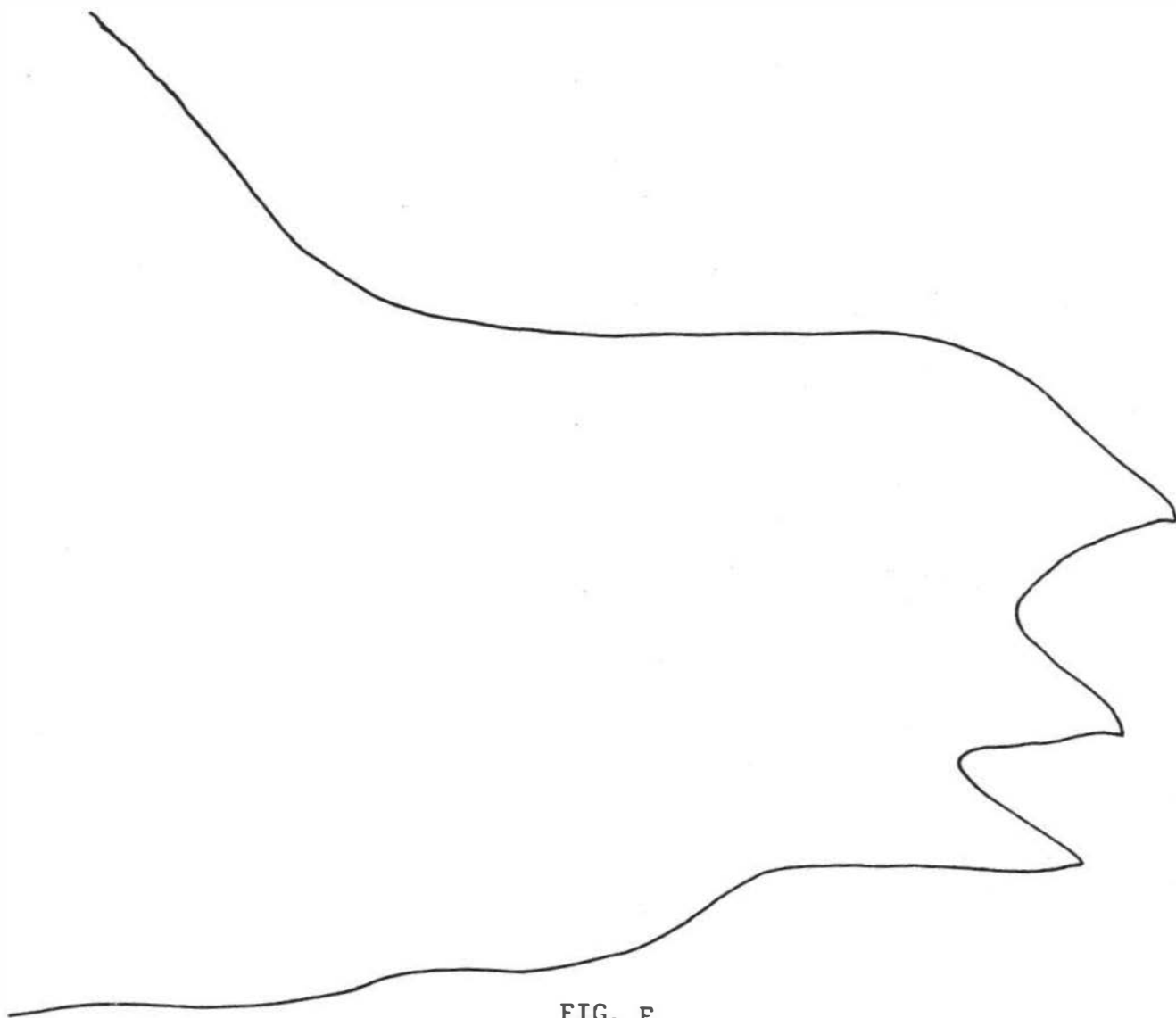


FIG. E

FAMILY: CALYPOGIACEAE

Calypogeia trichomanis (L.) Corda

Plants in flat patches or mats, green to brownish; leafy shoots 1-4 mm. wide. Stems 2-5 cm. long, prostrate to ascending, thick, sparingly branched; rhizoids numerous, from bases of underleaves, long, colorless; leaves imbricate, very obliquely inserted, somewhat clasping the stem ventrally, not at all or slightly decurrent ventrally slightly convex dorsally, broadly ovate to cordate; apex rounded to shortly 2-toothed; margin otherwise entire; median cells of leaf 30-80 μ , polygonal; walls thin; trigones mostly lacking; cuticle usually smooth; gemmae spherical to ellipsoid, yellowish green; underleaves 1-3 times as wide as the stem, orbicular to oval, slightly decurrent, 2-lobed; lobes rounded to obtuse; sinus extending about 1/2 to base, narrow, its base roundedly obtuse to obtuse; plant bisexual; male inflorescences below the female ones, on very short branches from axils of underleaves, linear-spicate when mature; male bracts 4-6, somewhat roundish, 2-3 lobed; perigynia solitary or paired, subcylindric; sporangium brown; epidermal cells large, in 12 rows on each valve; cells of inner layer small; elaters 8-10 μ wide; spirals 2, reddish brown; spores 10-14 μ , pale brown, smooth.

Habitat: On ground, rotten logs, and peat.

Illinois distribution: Clark, Coles, Menard, and Shelby Counties.

Calypogeia trichomanis (L.) Corda

Fig. A - Dorsal view - 40 X.

Fig. B - Ventral view - 40 X.

Fig. C - Leaf - 40 X.

Fig. D - Underleaf - 40 X.

Fig. E - Leaf cells - 160 X.

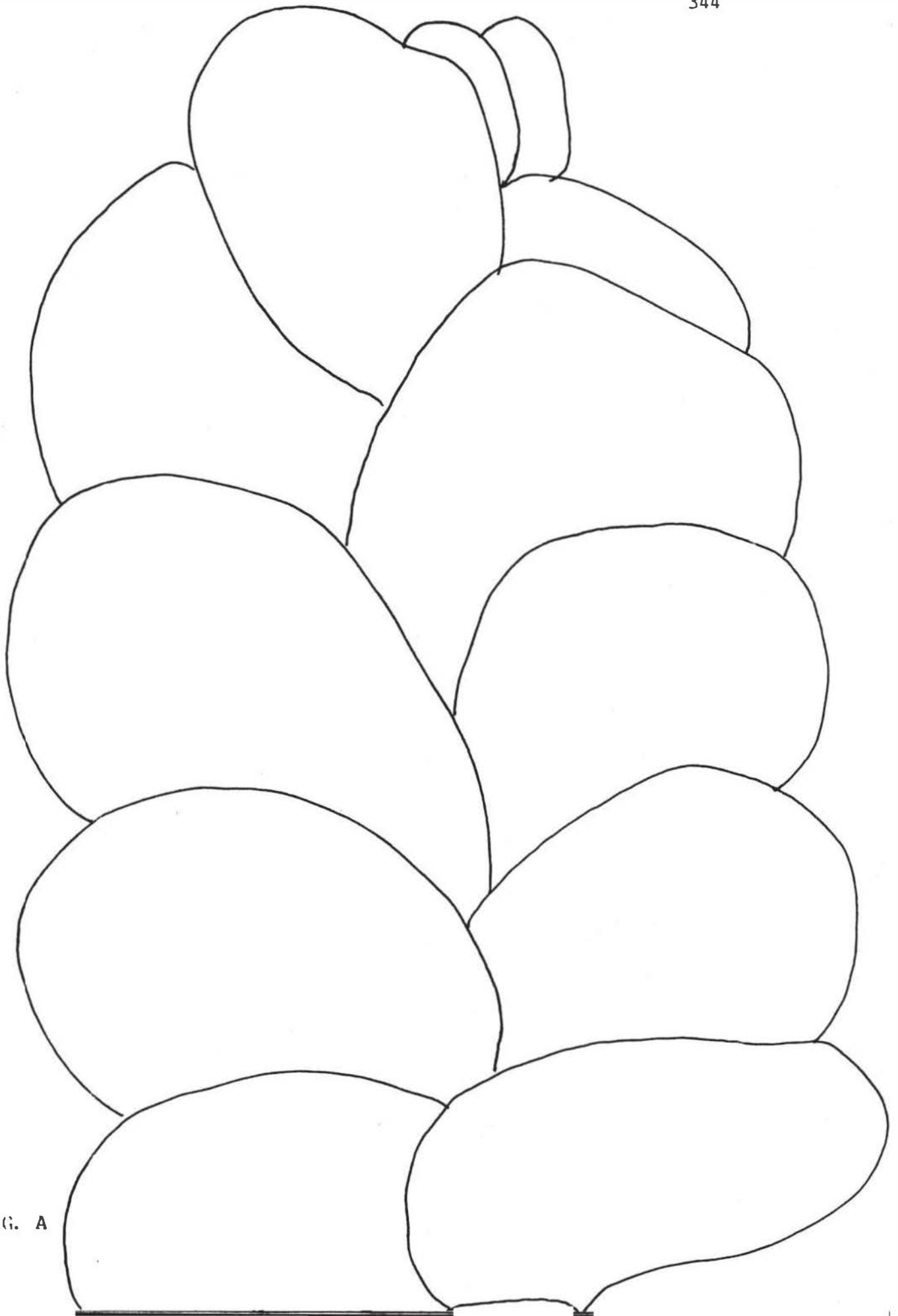


FIG. A

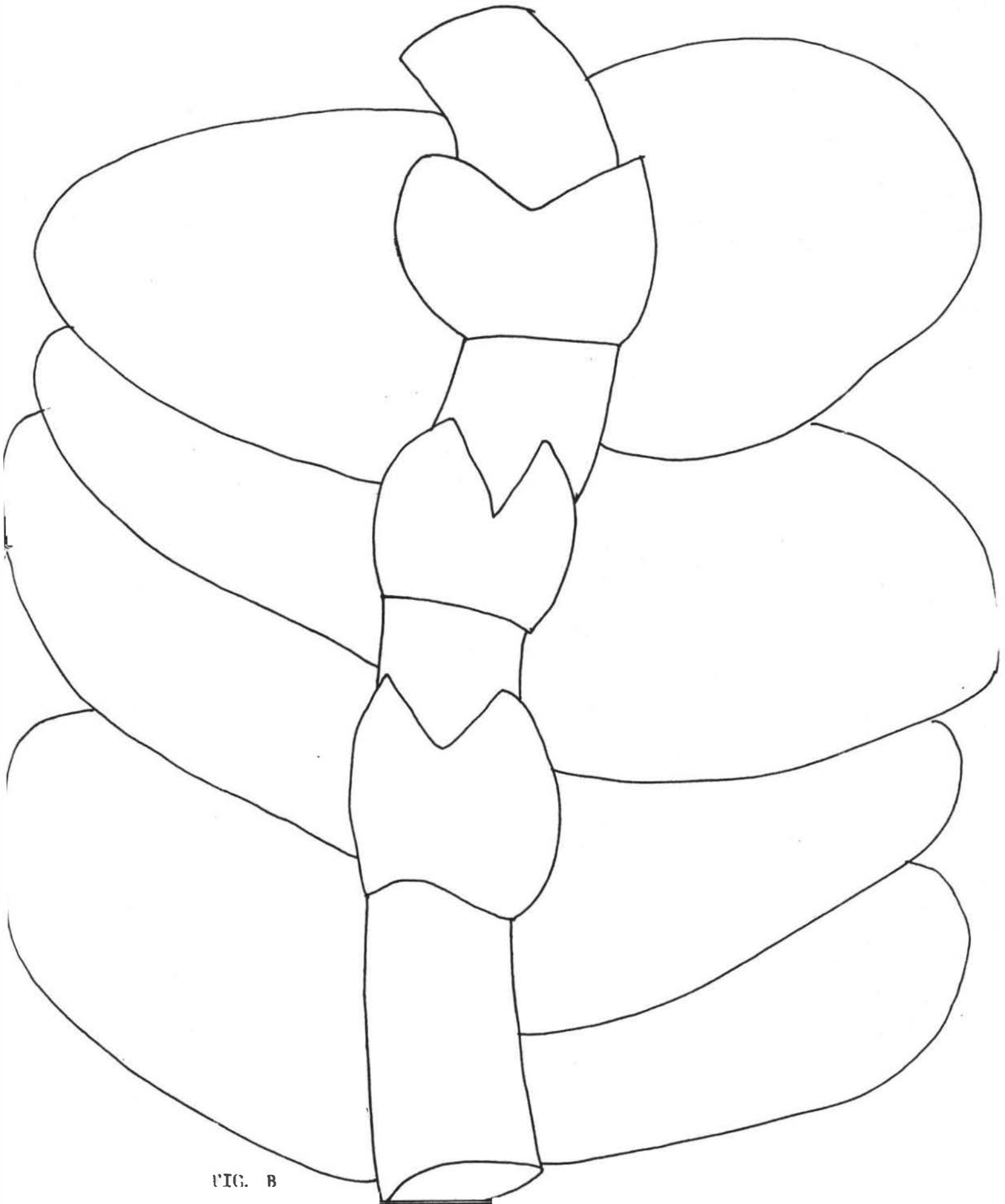


FIG. B

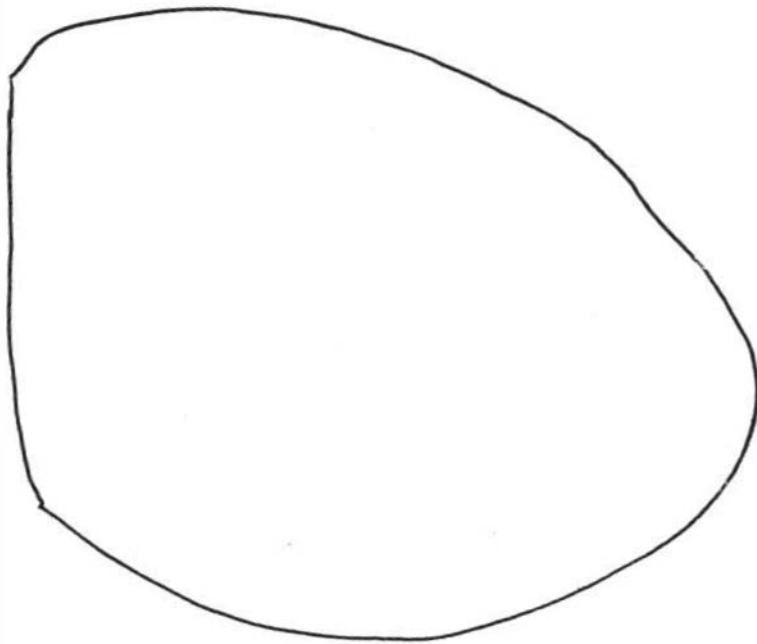


FIG. C



FIG. D

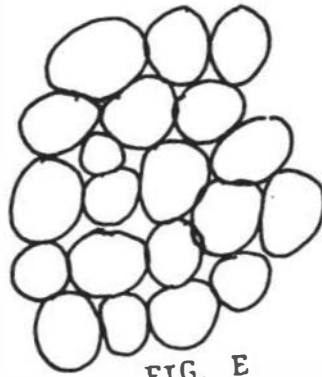


FIG. E

FAMILY: CEPHALOZIACEAE

Cephalozia media Lindb.

Plants in mats, light green to dark green; stems 1-2 cm. long, prostrate with ascending tops, flat dorsally, convex ventrally; branches few, ventral in origin; rhizoids rather few, colorless, long; leaves alternate, succubous, distinctly dorsally decurrent, distant to loosely imbricate, spreading, somewhat dorsally secund, simple 2-lobed, rounded to ovate, 140-400 μ in diameter, somewhat concave, 7-14 cells wide; margin entire; lobes often slightly unequal, the dorsal usually the narrower and more pointed, connivent acuminate or acute, ending in 1 or 2 cells; sinus descending about 1/3 the leaf length, obtuse to rounded; cells of mid-leaf 22-30 μ in lobes 20-27 μ , of base 25-40 μ ; walls slightly thickened; gemmae at tip of stem, in clusters, oblong to pyriform or angled, 1-celled, greenish white, 15-20 μ ; underleaves usually wanting except among the female bracts and bract-like leaves just beneath them; plants unisexual; male inflorescence a short modified ventral branch; male shoots much like the leaves, often 2-lobed for 1/2 their length, sometimes with a third lobe on the dorsal margin, saccate-concave, very densely appressed-imbricate; antheridium 1; female inflorescence terminal on a short modified ventral branch; female bracts much larger than the leaves and sometimes united, 2-lobed to about 1/3 their length, sometimes with an additional tooth or lobe on each margin; lobes lanceolate to acute or acuminate; sinuses acute to obtuse; bracteole as large as bracts, often united at base with 1 of the bracts; perianth subfusiform, 1.5-2.4 mm. long, 400-800 μ

wide, $3/4$ -4.5 emergent, with 3 blunt plicae in upper $1/4$, 3 cells thick near base, usually 2 cells thick to above middle, gradually contracted to mouth; mouth rather wide, crenulate-denticulate, the teeth 1 or sometimes 2 cells thick throughout; seta short; sporangium oblong-oval to oblong-cylindrical, reddish-brown; elaters 7-9 μ thick; spiral 2 loosely wound, reddish-brown; spores 10-12 μ , finely papillose, reddish brown.

Habitat: On rotten wood, on rocks, on sandy or peaty soil.

Illinois distribution: Clark, Pope, and Shelby Counties.

Cephalozia media Lindb.

Fig. A - Dorsal view - 26.5 X.

Fig. B - Ventral view - 26.5 X.

Fig. C - Leaf - 26.5 X.

Fig. D - Leaf cells - 104 X.

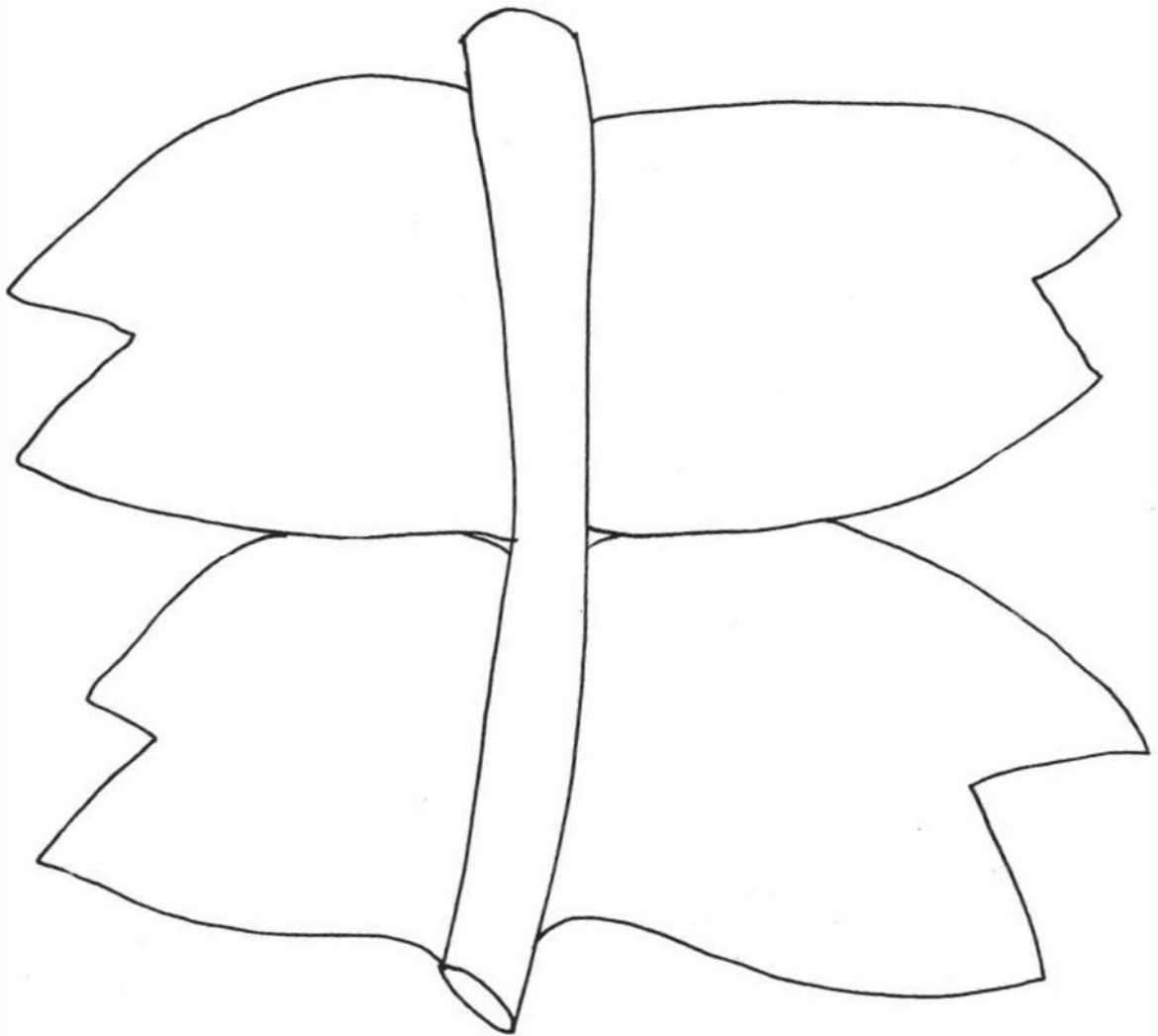


FIG. A

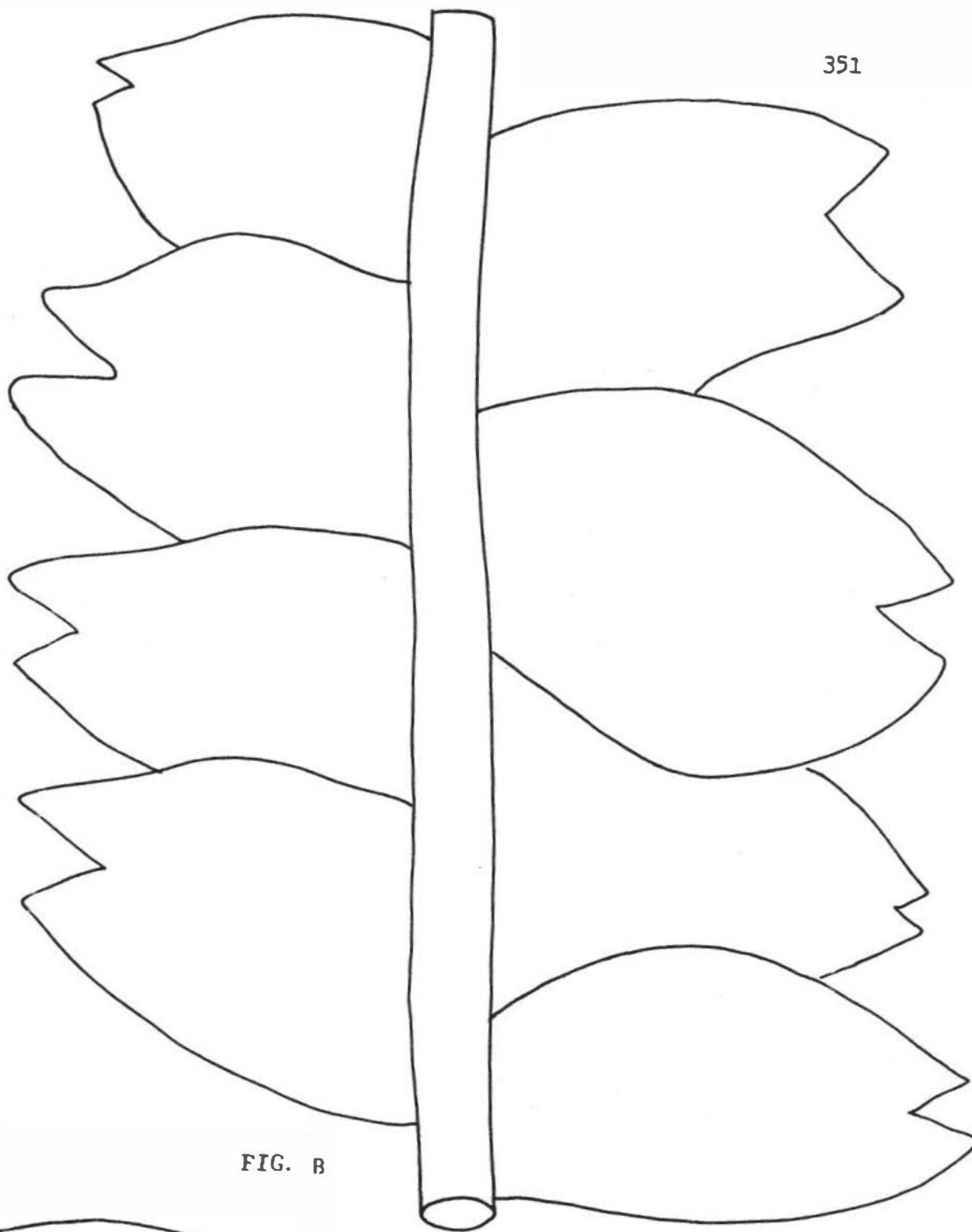


FIG. B

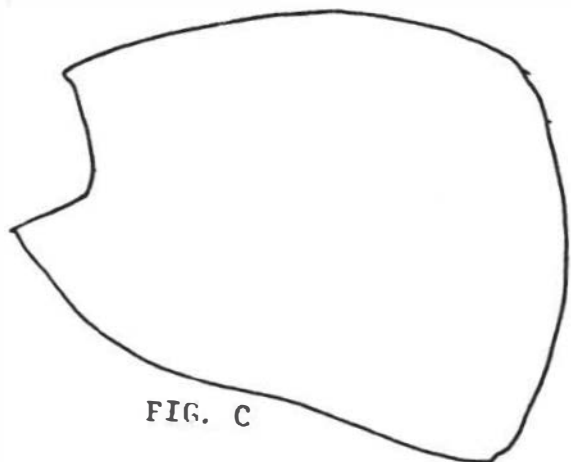


FIG. C

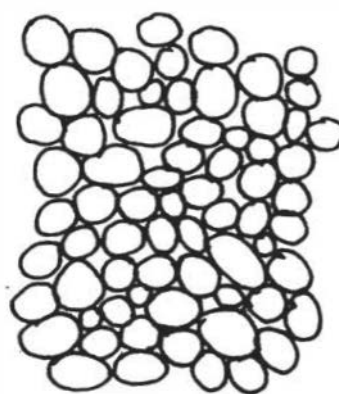


FIG. D

FAMILY: JUNGERMANNIACEAE

Jamesoniella autumnalis (DeCand.) Steph.

Plants in dense patches, large, olive green or the tips glaucous green, reddish when old; stems 1-4 cm. long, prostrate, stout, simple or branched, often innovating below the bracts; branches arising from the ventral region of the leaf axil; rhizoids numerous to near stem tip, hyaline; leaves alternate, succubous, somewhat decurrent dorsally, crowded, imbricate, large, with a wide insertion, not or hardly bilobed, convex; those of lower part of stem horizontal, spreading, oblong-oval; those of the upper part of female stem appressed, roundish-oval; apex roundish to retuse; margin entire; cells of leaf middle 25-35 μ , of the margin about 20 μ , of the base 35-50 μ ; walls thin; trigones rather small, distinct; cuticle smooth or finely striate; underleaves present only on younger parts, frequently obsolete, commonly narrowly lanceolate, or subulate; plants unisexual; male inflorescence along median part of the stem, sometimes several in series on the same stem; bracts 8-12, erect, ventricose at base, closely imbricate, with 1-2 teeth on dorsal margin; antheridia solitary, large, on rather a long stalk; female bracts rather larger than the foliage leaves, with or without a cilium-like tooth on one or both margins near base, transversely inserted, spreading at base, recurved at tip, oblong to roundish-oblong, rounded to emarginate at tip, often with 1-4 teeth or cilia on one or both margins near base, often adnate to the bracteole; bracteole larger than the bracts, lanceolate, sometimes bifid for 1/2 the length, laciniate; the lacineae 3-4, cilia-like,

often hooked; perianth united with the upper bracts for a small part of its length, 1/2-3/4-emergent, narrowly clavate-cylindrical, 4-5-plicate near mouth, slightly contracted at tip; mouth large, with long unequal cilia; sterile perianth hardly emergent, ovate, plicate; seta long; sporangium ovoid, reddish purple, the walls composed of 4 layers of cells; epidermal cells with modular thickenings on radial wall; cells of all three inner wall layers with semiannular thickenings; elaters about 100 μ long and 8 μ thick, slightly attenuate; spirals 2, laxly coiled; spores 11-15 μ , finely verruculose, reddish brown.

Habitat: On ground, rocks, or decaying wood.

Illinois distribution: Clark, Cook, Fulton, Jackson, Johnson, LaSalle, Menard, Peoria, St. Clair, Shelby, Stark, and Union Counties.

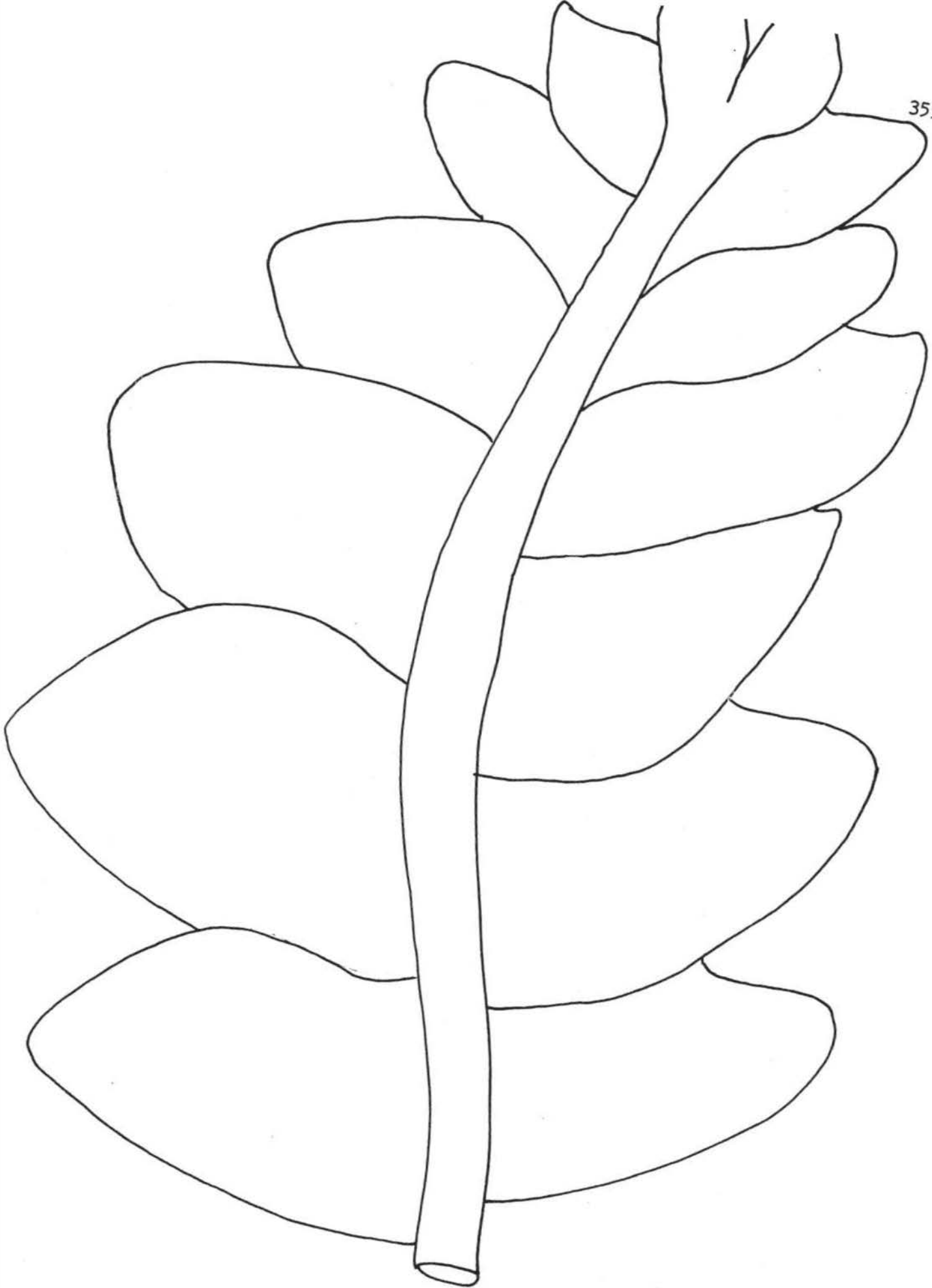
Jamesoniella autumnalis (DeCand.) Steph.

Fig. A - Dorsal view - 40 X.

Fig. B - Ventral view - 40 X.

Fig. C - Leaf - 40 X.

Fig. D - Leaf cells - 400 X.



355

FIG. A

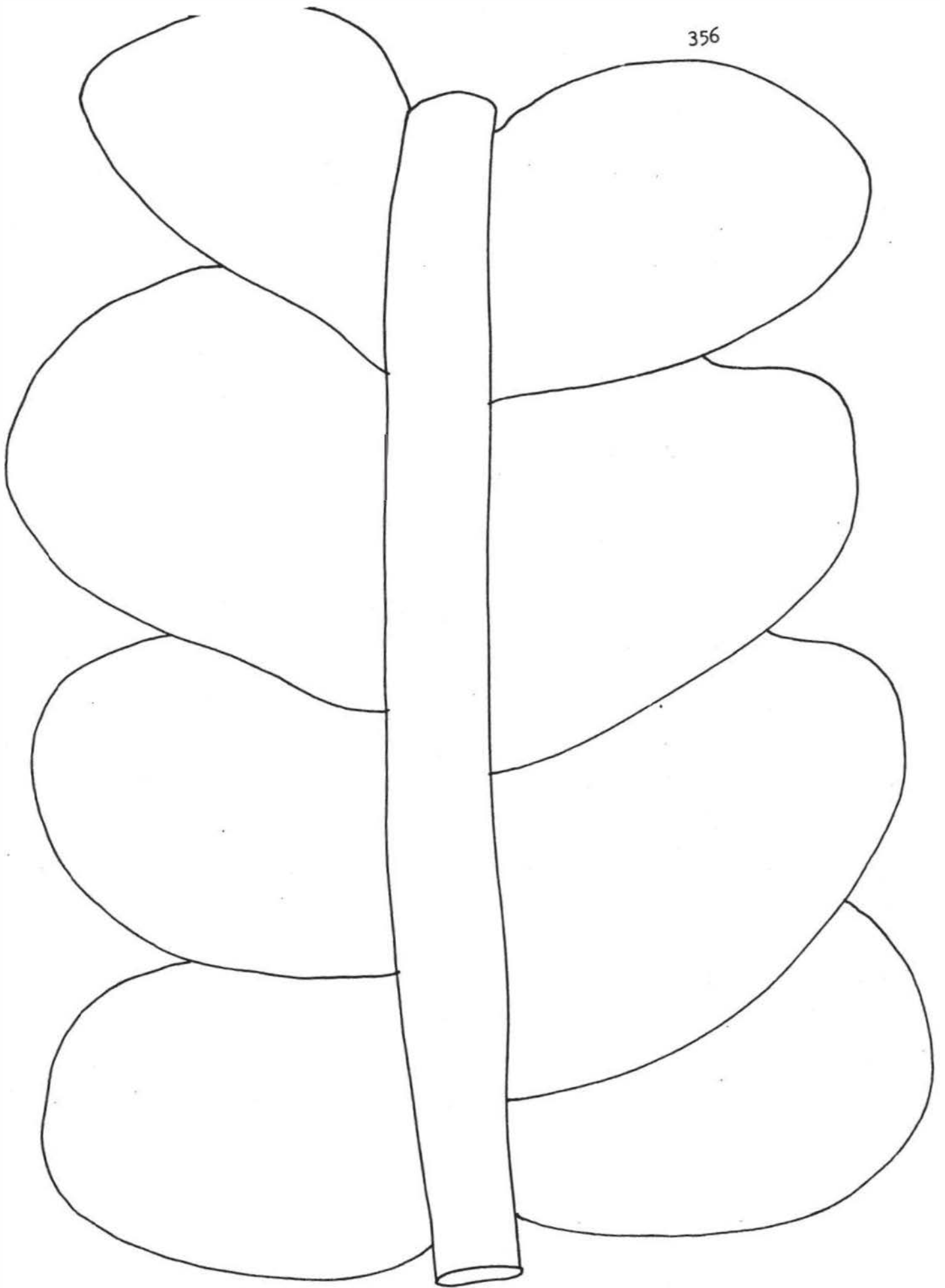


FIG. B

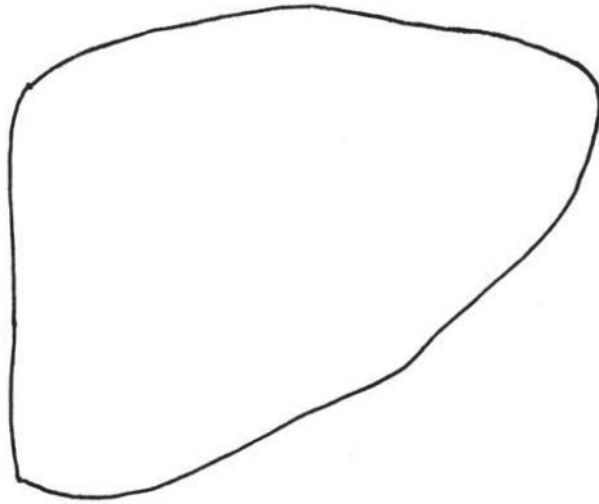


FIG. C

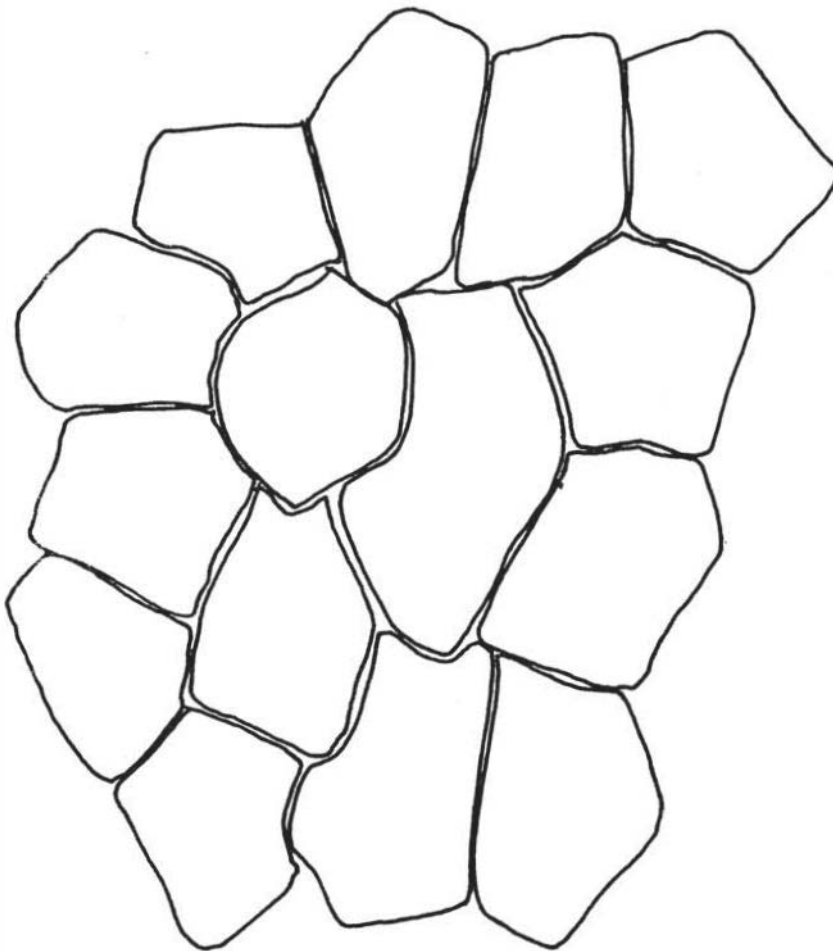


FIG. D

FAMILY: HARPANTHACEAE

Lophocolea heterophylla (Schrad.) Dum.

Plants in patches or mats, pale yellowish green; leafy shoots, 1-2 mm. wide; stems 2 cm. long, prostrate, 150-270 μ thick, irregularly branched; branches lateral or rarely ventral, sometimes with deeply and acutely 2-lobed leaves; rhizoids alternate, quite strongly succubous, the insertion extending about half around the stem, dorsally decurrent, spreading horizontally, simple, 2-lobed to quite unlobed, oblong-quadrate, 1-1.3 mm. long, 0.6-1 mm. wide, convex; margin entire; lobes rounded to acute; sinus from wanting to $1/5$ the leaf length, crescentic to right-angular; cells of the leaf middle 20-48 μ , of the lobes about 20 μ ; walls thin; trigones wanting to minute; cuticle smooth or occasionally striate; gemmae unknown; underleaves comparatively large, erect to erect-spreading, about $1/3$ as long as the leaves, 2-lobed for $1/2$ - $3/4$ length; with an additional tooth on each margin; the lobes subulate, acuminate, turned toward the stem; plants bisexual; male inflorescence immediately below the female bracts, or farther down, or on a separate branch below the female inflorescence, larger to smaller than the leaves of sterile plants depending upon the position, 6-10 in number with inflated lobe on base of dorsal margin, the lobule with 1-2 teeth at margin; antheridia 1 or rarely 2, about 140 μ thick; female inflorescence on rather short lateral or sometimes ventral branches, female bracts slightly larger than the leaves, erect cuneate, or oblong-quadrate, retuse to shortly and irregularly 2-4 lobed; bracteole almost as large as the bracts, deeply

2-lobed; the lobes lanceolate, the outer margins with 1-3 cilia or teeth; perianth oblong, 1.3-3.2 mm. long, 0.6-1.3 mm. wide; sharply 3-angled to base, long exserted; mouth laterally flattened, 3-lobed for $1/6$ - $1/3$ the length of the perianth; the lobes subtruncate to rarely acute, repand-dentate, seta 1.5-2 cm. long, rather deeply shoved into the tip of the stem; sporangium ovoid, about 1.2 mm. long, 0.7-1 mm. thick, reddish-brown, elaters 110-210 μ long, 8-11 μ thick; spirals 2, reddish brown; spores 8-16 μ , minutely punctate, yellowish brown.

Habitat: On rotten wood and on trunks of trees, on sod, and rocks; and in wet situations.

Illinois distribution: Clark, Coles, Cook, Fulton, Jackson, Johnson, LaSalle, Macon, Menard, Peoria, Pope, Saline, and Shelby Counties.

Lophocolea heterophylla (Schrad.) Dum.

Fig. A - Dorsal view - 40 X.

Fig. B - Ventral view - 40 X.

Fig. C - Leaf - 160 X.

Fig. D - Underleaf - 160 X.

Fig. E - Leaf cells - 400 X.

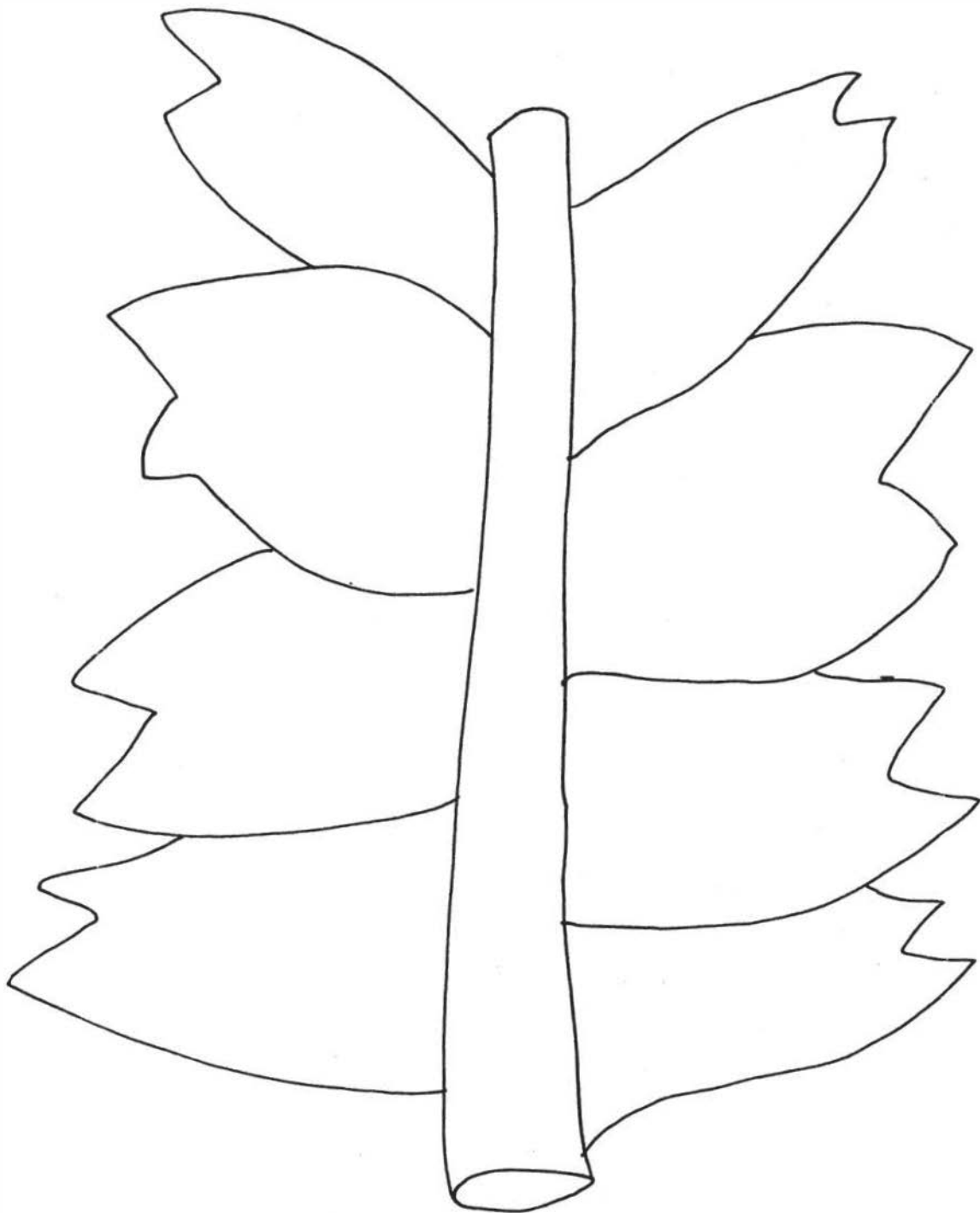


FIG. A

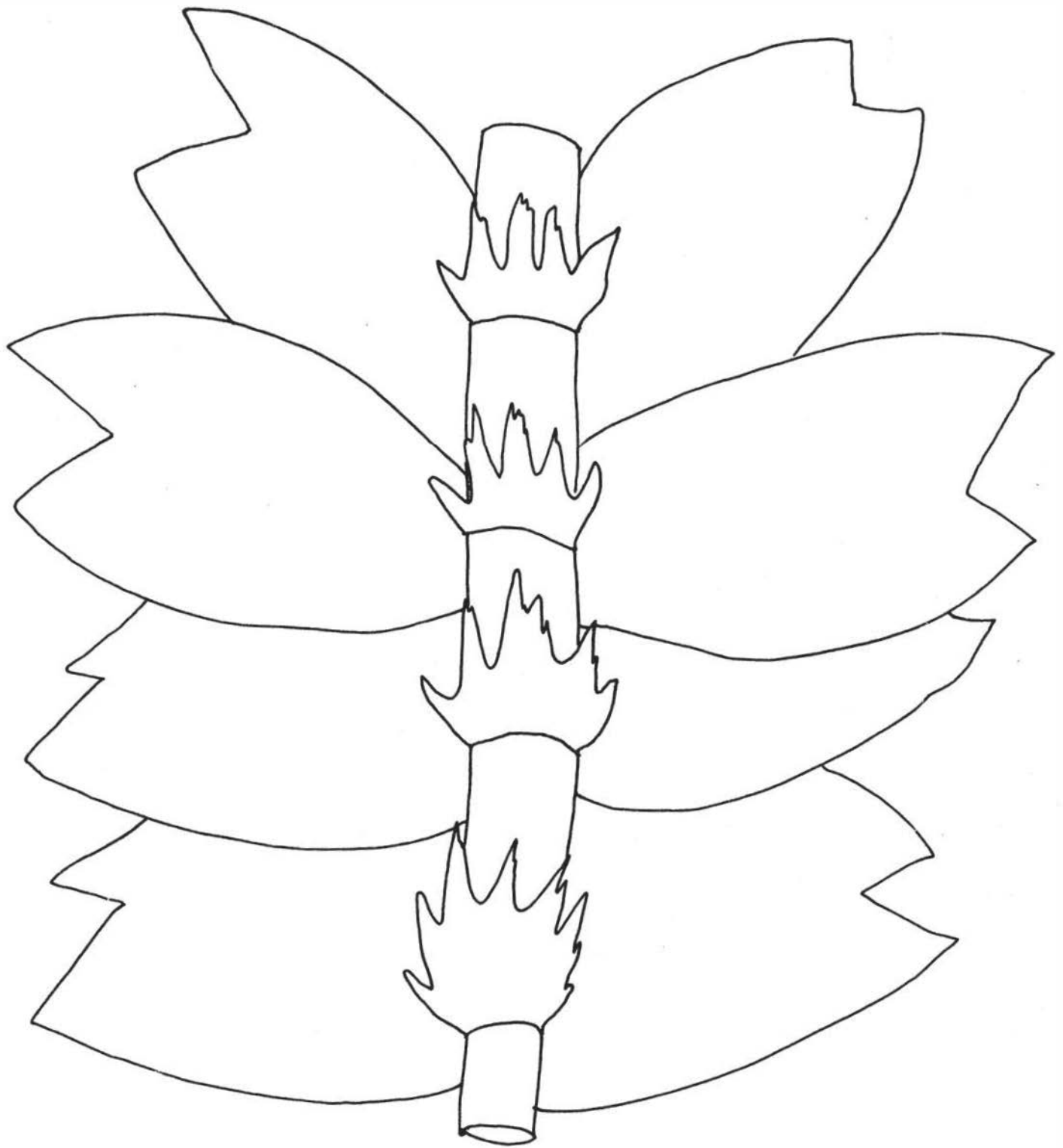


FIG. B

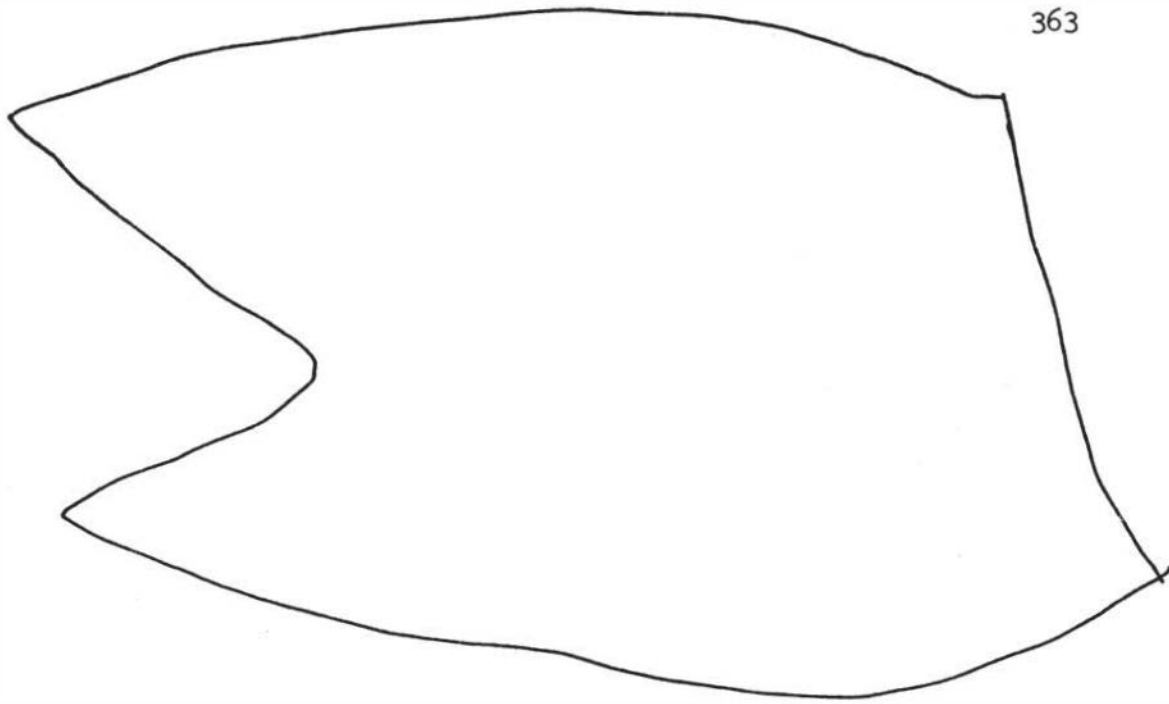


FIG. C



FIG. D

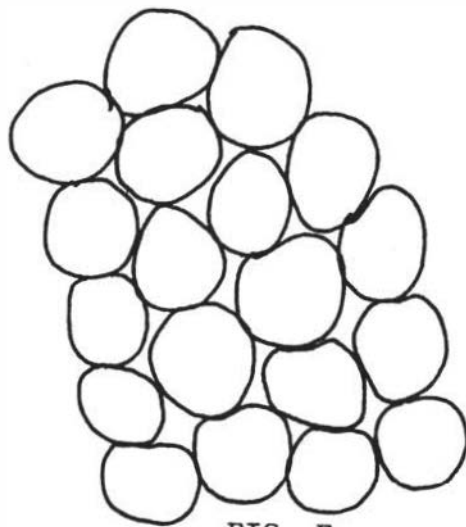


FIG. E

FAMILY: PLAGIOCHILACEAE

Plagiochila asplenioides (L.) Dum.

Plants in patches or mats, green to dark green; leafy shoots 4-8 mm. wide, stems 2-10 cm. long, reddish brown, prostrate with the branches mostly ascending to erect, simple or irregularly branched, the prostrate portion rhizomatous; branches rather numerous, often from beneath the perianth; commonly those from near base flagelliform, at first leafless, bearing rhizoids; rhizoids wanting to quite scarce on ascending branches, never common except on rhizomes, colorless; leaves alternate, quite succubous, the insertion less than a semicircle, decurrent both dorsally and ventrally, mostly contiguous to imbricate but distant and small below, spreading to erect-spreading, often horizontal, unlobed, roundly ovate, 2-4 mm. long, 1-3.5 mm. wide; in adaxial view concave along the median line below, convex toward the dorsal margin; apex rounded, without indication of bilobing; dorsal margin usually entire, sometimes somewhat toothed along its upper part, revolute the whole length, nearly straight, long decurrent; ventral margin usually dentate to near base but sometimes entire, not to little revolute, widely arching, shortly decurrent and not leaving two distinct lines of decurrence along the stem; margin as a whole with 0-35 teeth but commonly with about 20, marginal teeth mostly 2-4 cells long and 1-2 cells wide at base; cells of the leaf middle 30-37 μ , of the margin 22-30 μ , hexagonal; walls thin to slightly thickened; trigones small to bulging; oil bodies 6-12, small; cuticle finely punctate; gemmae unknown; underleaves wanting or present only near the tips of the

shoots, minute, subulate or 2-lobed; plants unisexual; male plants usually in separate patches; male inflorescence terminal or farther down; male bracts 8-20, smaller than the leaves of the sterile shoots, closely imbricate, erect, concave, with dorsal margin broadly inflated; antheridia 1-3; female bracts similar to the leaves of sterile stems but wider and irregularly dentate; perianth oblong or somewhat clavate, 4-7 mm. long, 1.6-3.7 mm. wide, terete below, laterally compressed above, 1/2-4/5-emergent; mouth bent to one side along a diagonal line making it appear to be sloping, irregularly ciliate-dentate; seta 1.5-5 cm. long; in cross section of cells much the same throughout, the epidermal cells 40-50 in number; sporangium ovoid, about 1.5-2 mm. long, purplish brown, its walls about 7 cells thick; epidermal cells large; innermost wall layer of small cells with semiannular thickenings; elaters 140-200 μ long, 9-14 μ thick; spirals 2, purplish; spores about 12-24 μ , minutely punctate, reddish brown.

Habitat: On rocks, on logs or trunks of trees, on wet banks, or among other bryophytes.

Illinois distribution: Clark, Coles, Gallatin, Johnson, Pope, Shelby, and Union Counties.

Plagiochila asplenioides (L.) Dum.

Fig. A - Dorsal view - 26.5 X.

Fig. B - Ventral view - 26.5 X.

Fig. C - Leaf - 40 X.

Fig. D - Leaf cells - 640 X.

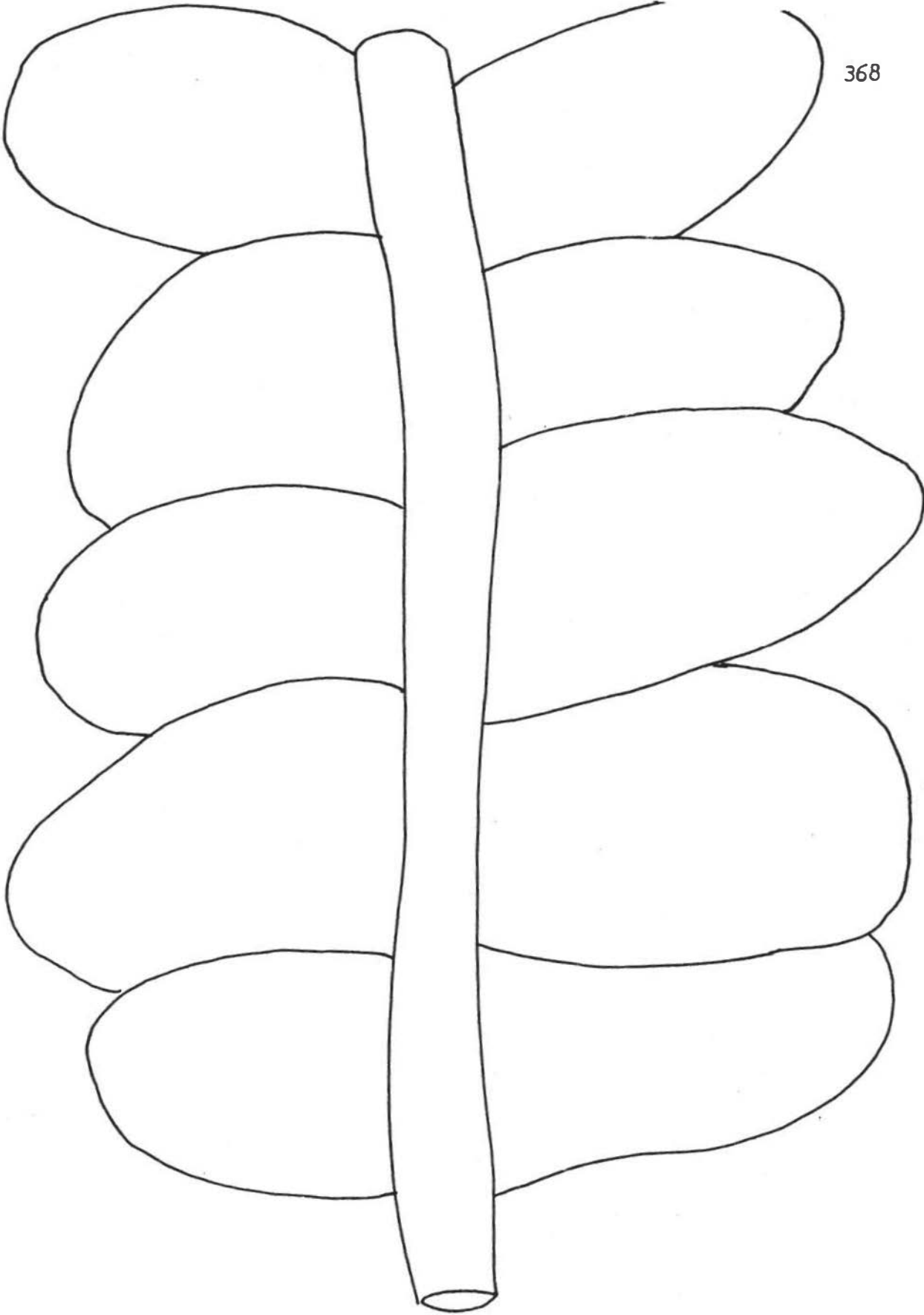


FIG. A

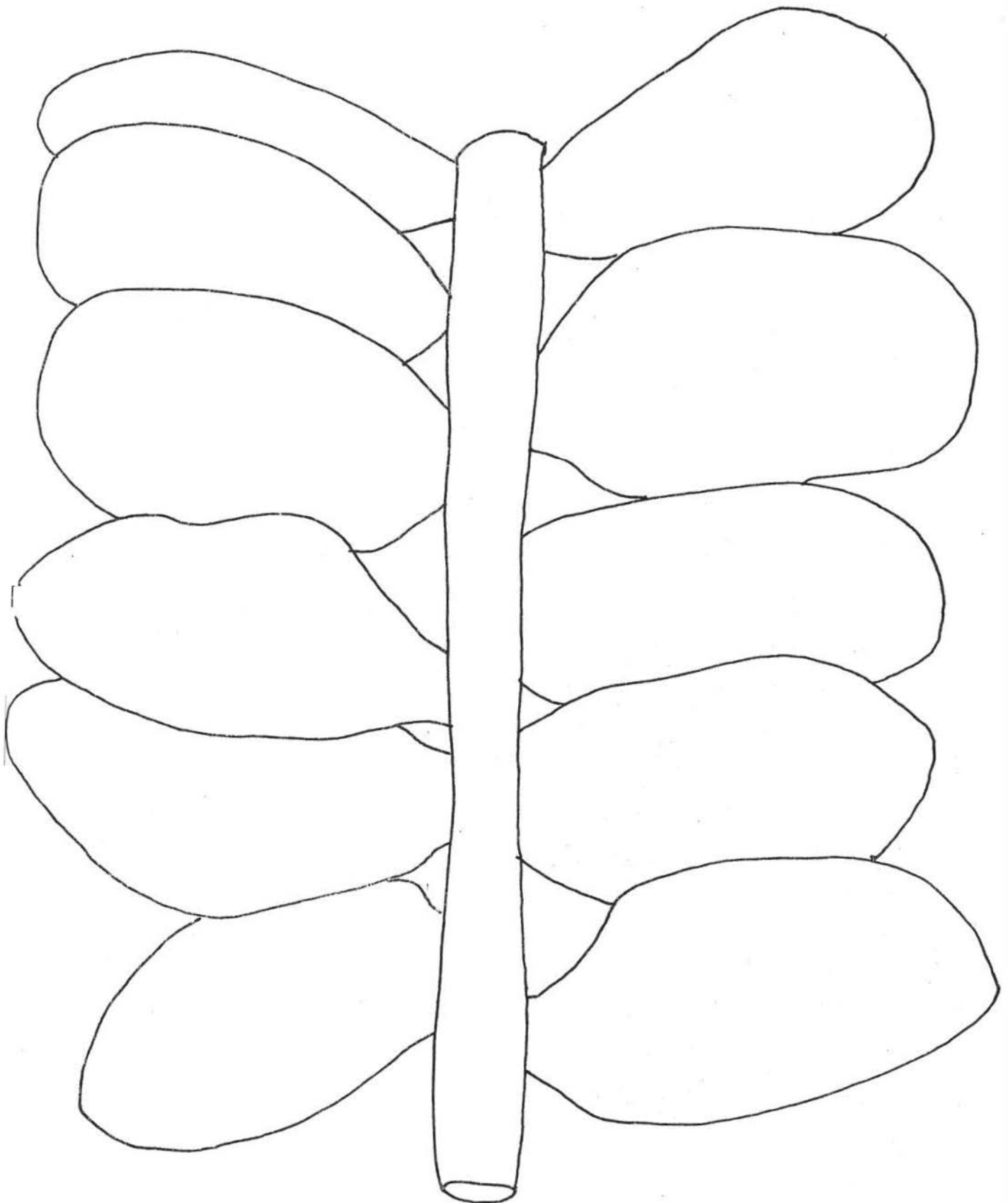


FIG. B

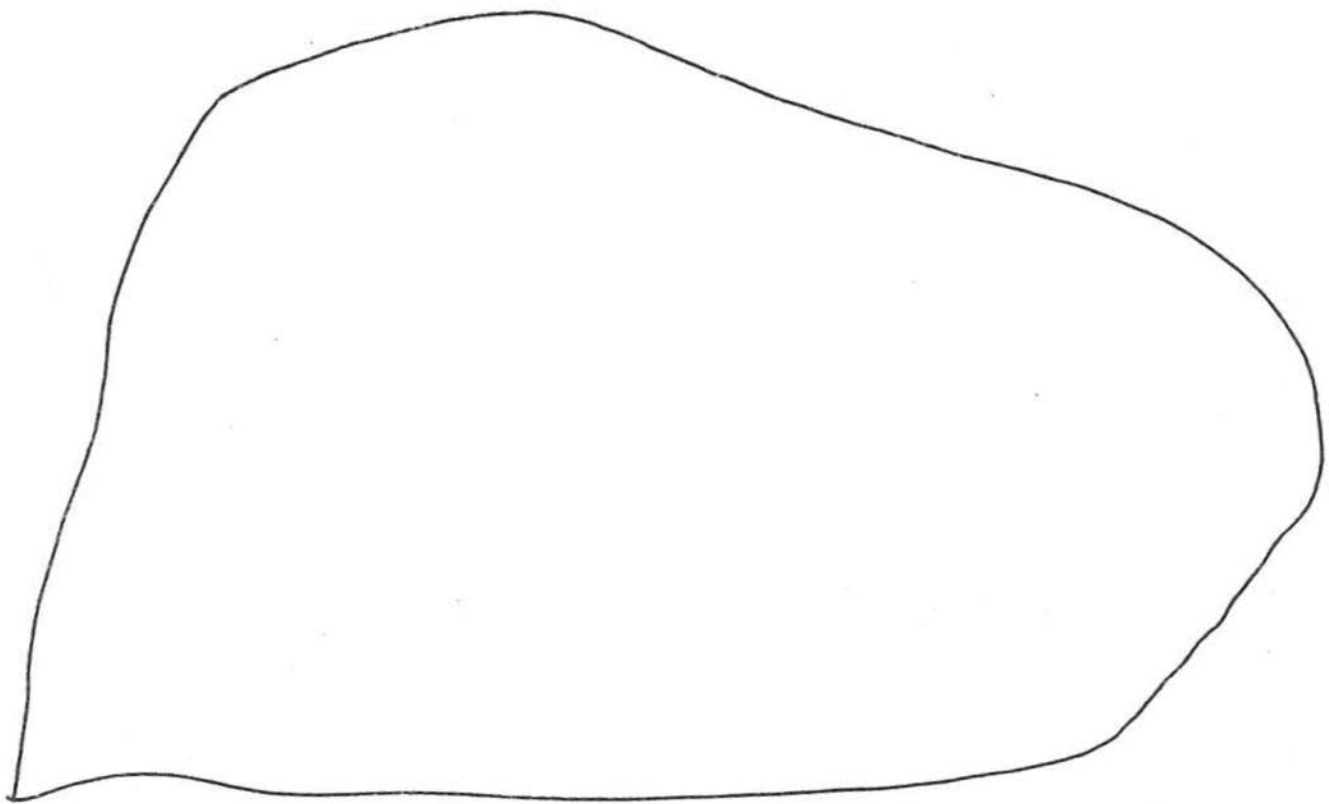


FIG. C

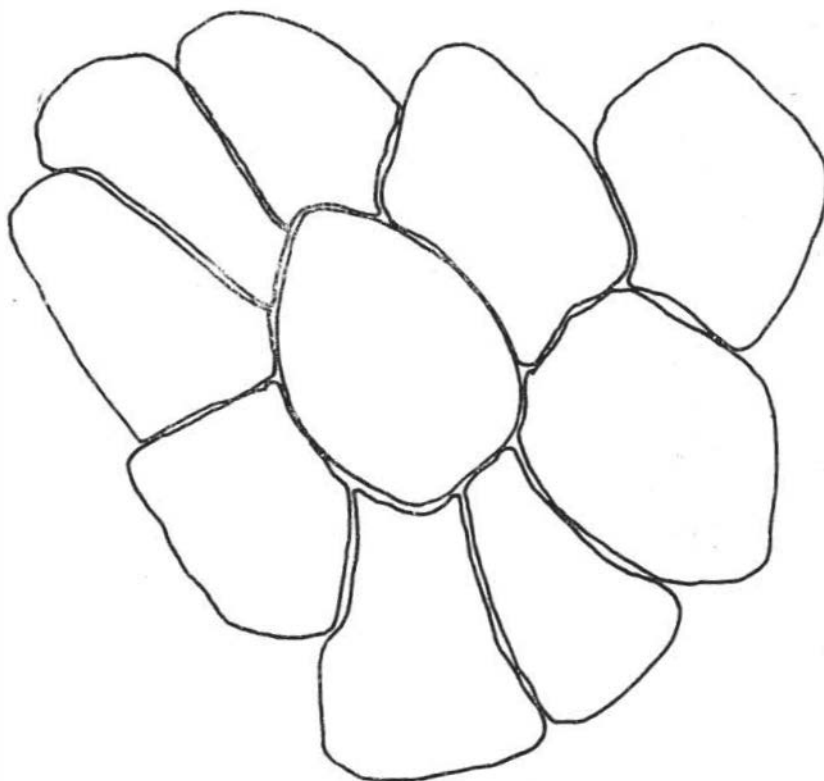


FIG. D

FAMILY: SCAPANIACEAE

Scapania nemorosa (L.) Dum.

Plants in dense patches, green or olive green to brownish or reddish; leaf shoots 2.5-4.5 mm. wide; stems 1-10 cm. long, erect, dark brown, paler toward tip, bent toward ventral side at tip, simple; rhizoids scarce; leaves larger upward on the shoot, distant to imbricate; keel straight to moderately concave dorsally but rarely a semicircle, 250-800 μ long; dorsal half of the leaf transversely inserted, not decurrent, diverging at an angle of 20-45 degrees with the stem, broadly cordate-ovate to rectangular, 0.7-1.6 mm. long, 0.5-1.4 mm. wide, arching to the farther edge of the stem or up to 1.5 times the stem width beyond it; apex right-angular to rounded, usually obtuse, usually with a point when angular; margin usually ciliate-dentate but sometimes entire, always entire at base; ventral half transversely inserted with the line of insertion not or very little arching upward on the stem and ending about the level of the base of the keel, not decurrent, spreading at an angle of 50-85 degrees, elliptic to roundish-obovate, 1.1-2.8 mm. long, 0.75-2 mm. wide, 1.8-6.2 times as long as the keel, 1.2-2.4 times as long as the dorsal half; margin ciliate-dentate in the upper half or more of leaf, entire at base, sometimes wholly entire, more or less revolute; teeth usually 2-3 cells long, 1-2 cells wide at base; cells of middle of ventral half of leaf 14-22 μ , of margin 10-15 μ , oblong-rounded to polygonal, those of base but little different from the median ones; walls usually thin, or toward margin moderately thick; trigones small; cuticle nearly

smooth to granular-papillate; gemmae common, present on most sterile plants, at apex of stem and of upper leaves, in cluster, 1-celled, ellipsoid to ovoid or sometimes pyriform, about 8 by 17 μ , reddish brown; plants unisexual; the two sexes in the same clump; male inflorescences terminal on unmodified shoots; male bracts distinctly small than the leaves of sterile stems, 8-10, imbricate; dorsal lobe ventricose at base, apiculate, entire; ventral lobe somewhat larger, dentate near its tip; antheridia 3-6; paraphysis linear to subulate; female bracts larger than the leaves of sterile stems, the lobes more nearly equal; perianth 1/2-3/5-emergent, oblong-obovoid, dorsiventrally compressed, bent toward the ventral side above its middle, cells near the mouth 10-20 μ ; mouth truncate, shortly lobed, ciliate and dentate; seta about 2 cm. long, sporangium oblong-ovoid, brown, its wall of 3 layers of cells; innermost layer of wall cells with numerous complete or more commonly incomplete semi-annular thickenings; elaters about 150 μ long, 6-8 μ thick; spirals 2, yellowish brown to reddish brown; spores 10-24 μ , finely verruculose, yellowish brown to reddish brown.

Habitat: On wet rocks or banks, on rotten wood.

Illinois distribution: Clark, Coles, Jackson, Johnson, LaSalle, Pope, Randolph, Shelby, and Union Counties.

Scapania nemorosa (L.) Dumort.

Fig. A - Dorsal view - 26.5 X.

Fig. B - Ventral view - 26.5 X.

Fig. C - Leaf - 40 X.

Fig. D - Underleaf - 26.5 X.

Fig. E - Leaf cells - 160 X.

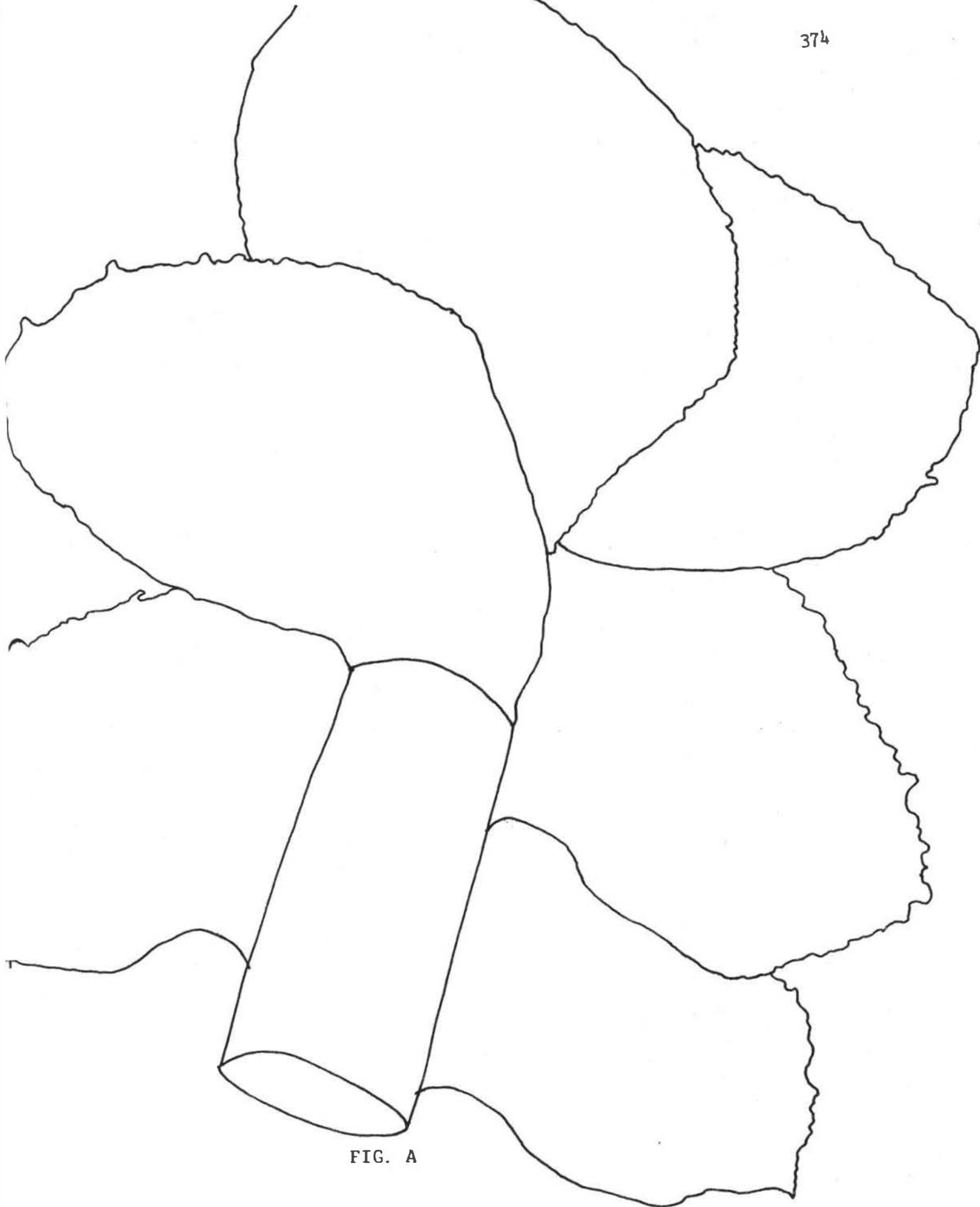


FIG. A

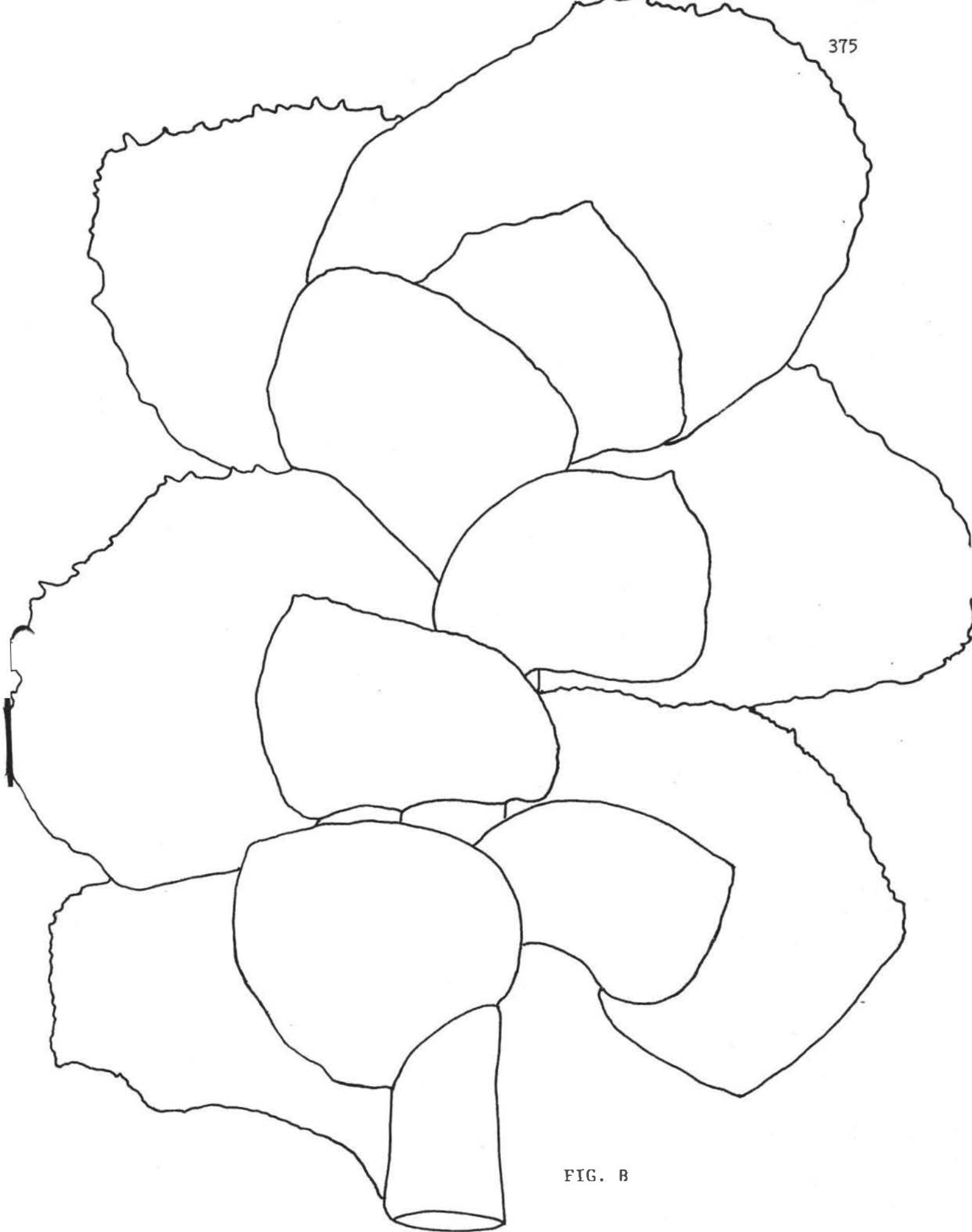


FIG. B

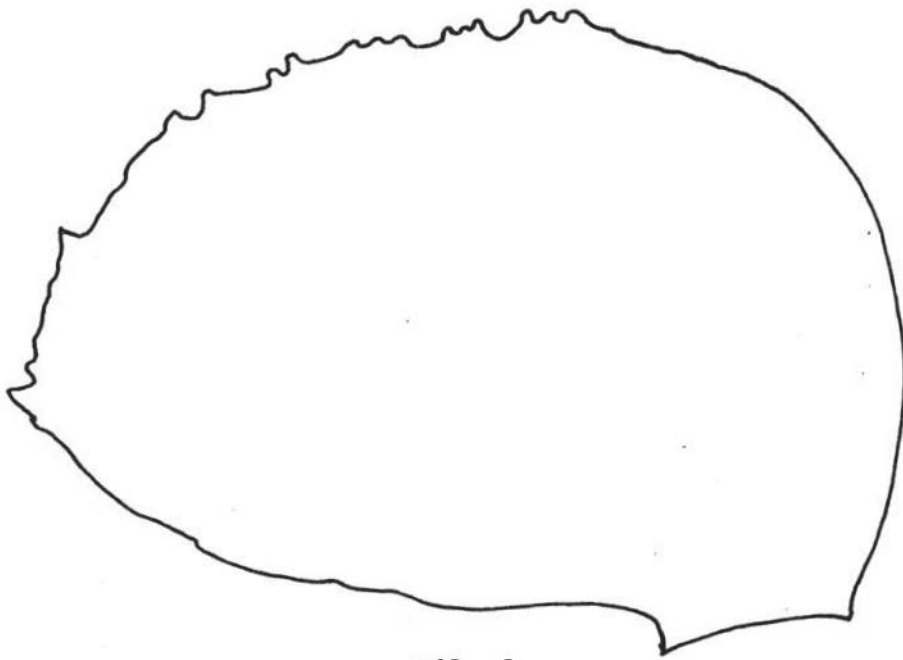


FIG. C

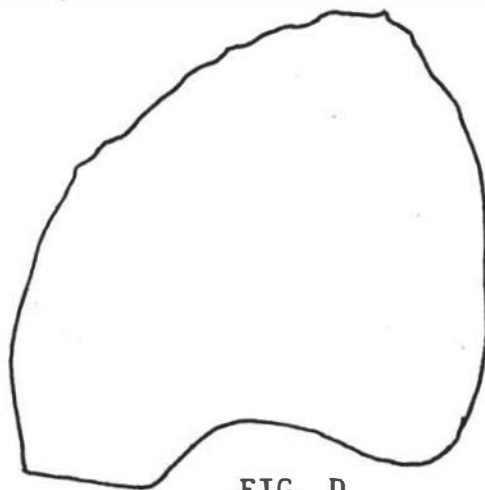


FIG. D

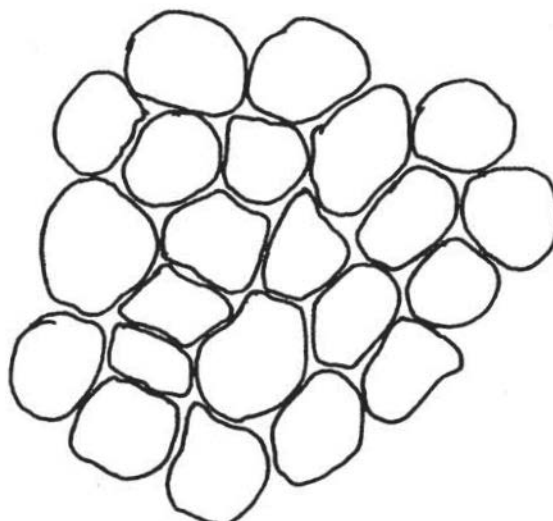


FIG. E

FAMILY: PORELLACEAE

Porella platyphylloidea (Schwein.) Lindb.

Plants in patches, not glossy, dull yellowish green to brownish green or rarely dark green; leafy shoots 1-25 mm. wide; stems prostrate, 3-8 cm. long, 2-3 pinnate; branches erect-spreading; rhizoids scarce, leaves closely imbricate; keel very short or practically none, dorsal half of leaf broadly obliquely ovate, spreading, slightly adaxially concave, 0.6-1.2 mm. long and about as wide, 1.5-2.8 times as long as the ventral half, the insertion ending about stem width above the level of the base of the keel, not decurrent; apex somewhat incurved, broadly rounded or more rarely obtuse; margins entire to sinuate or sometimes with a tooth above the base of the more strongly arched dorsal margin; ventral half ovate, sometimes more or less strongly arched dorsal margin; ventral half ovate, sometimes more or less auriculate at ventral base, erect-spreading, adaxially convex, 350-560 μ long and about as wide, about 1.5-2 times as wide as the stem, the line of insertion ending at or a little below level of base of keel, not at all to a little decurrent, apex sometimes recurved, bluntly acute to roundedly obtuse, margins entire or at base sinuate to 1-toothed, the dorsal one slightly and narrowly recurved; cells of middle of dorsal half of leaf 25-30 μ , of margins and apex 20-30 μ , not different near base of ventral margin, of central base 28-40 μ , polygonal with rounded corners; walls thin; trigones small to rather large; cuticle smooth, gemmae rare; underleaves approximate to imbricate, roundish quadrate to oblong quadrate, erect

to erect-spreading, the base applied to the stem, adaxially convex, 500-650 μ long when measured from the middle of the arch, and about as wide, 1-1.5 times as wide as the ventral half of the leaf, the insertion curving upward on the stem in an arch about stem width in height, longly decurrent on both sides; apex rounded to obtuse, usually reflexed; margin reflexed, entire, or sometimes sinuate to sparingly denticulate at apex, or occasionally sinuate below with a tooth at base; plants unisexual; male plants in separate patches; male inflorescence a lateral branch without normal leaves, oval to oblong, 1.5-3 mm. long; male bracts 10-12, nearly equally 2-lobed, strongly saccate, keel long, the dorsal half about 1.5 times as long as the keel, both lobes acute to obtuse; male bracteole free; female inflorescence a short lateral branch without normal leaves, most on the primary or secondary branches; female bracts small than the leaves, the keel long, the two halves much more nearly equal in length and both entire to denticulate, the dorsal lobe obtuse, the ventral one usually acute; bracteole free, large, broadly obovate, the margin entire; perianth ovoid to obovoid or pyriform, 1.5-1.9 mm. long, the basal part with 3 blunt ridges of which 2 are lateral and 1 ventral, more or less dorsiventrally flattened, especially near mouth; mouth distinctly 2-lipped, the lips not or only slightly curved toward the ventral side, the sinuses equal or the basal one somewhat deeper; lips distantly denticulate to ciliolate; seta not quite exserting the sporangium, sporangium spherical, 4-valved for about $3/4$ the length and the valves again more or less irregularly split from the apex, wall 2-3 cells thick; epidermal cells in surface view 1-2 times as long as wide, thin walled, with rather weak thickenings in some of the angles; innermost layer of the wall without thickenings; elaters 180-250 μ long,

7-10 μ thick; spirals 1-3, usually 2 to the end, brown, spores 36-55 μ , finely echinulate-papillose, yellowish brown.

Habitat: On rocks, trees, logs, or soil.

Illinois distribution: Clark, Coles, LaSalle, Shelby, and Union Counties.

Porella platyphylloidea (Schwain.) Lindb.

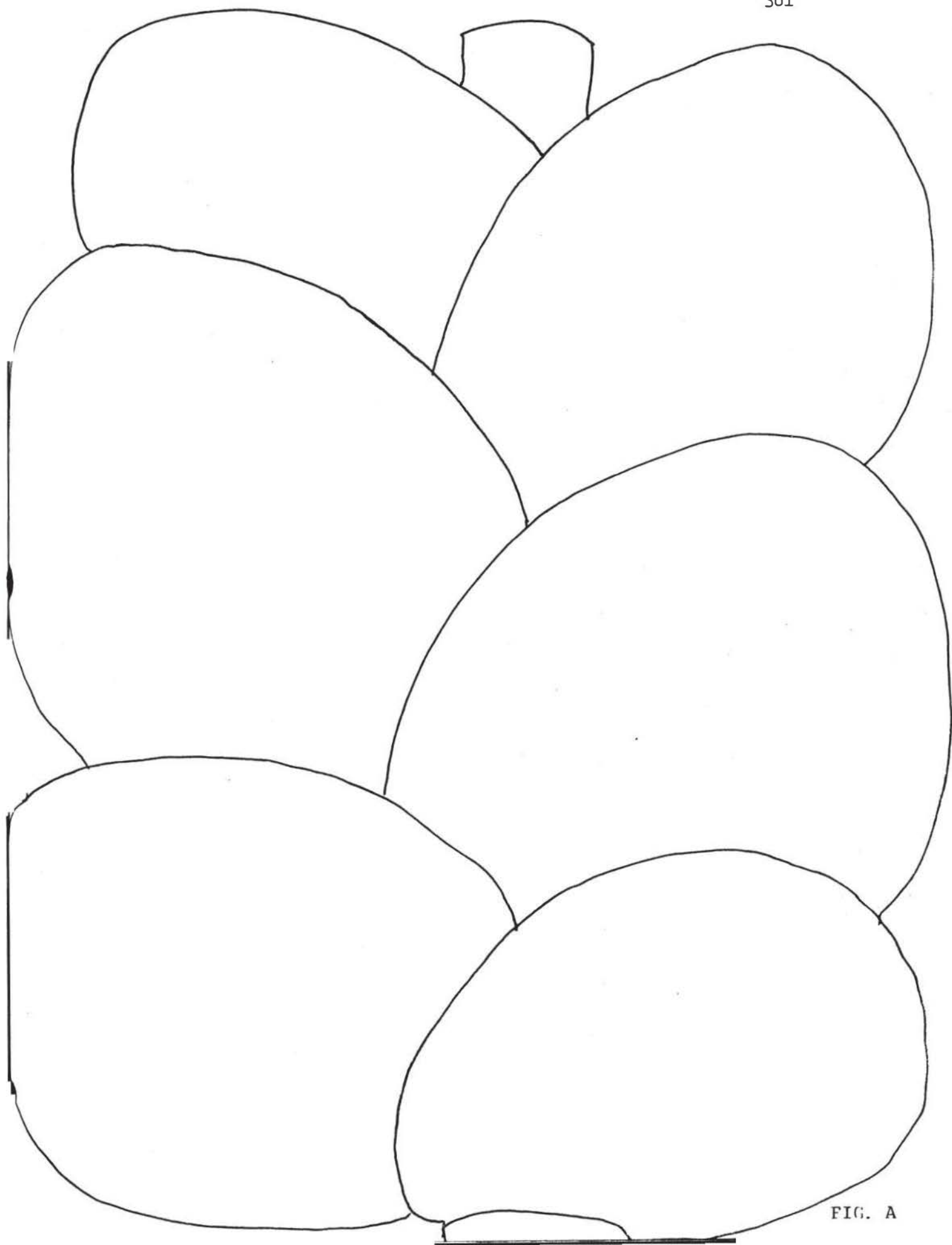
Fig. A - Dorsal view - 40 X.

Fig. B - Ventral view - 40 X.

Fig. C - Leaf - 40 X.

Fig. D - Underleaf - 40 X.

Fig. E - Leaf cells - 400 X.



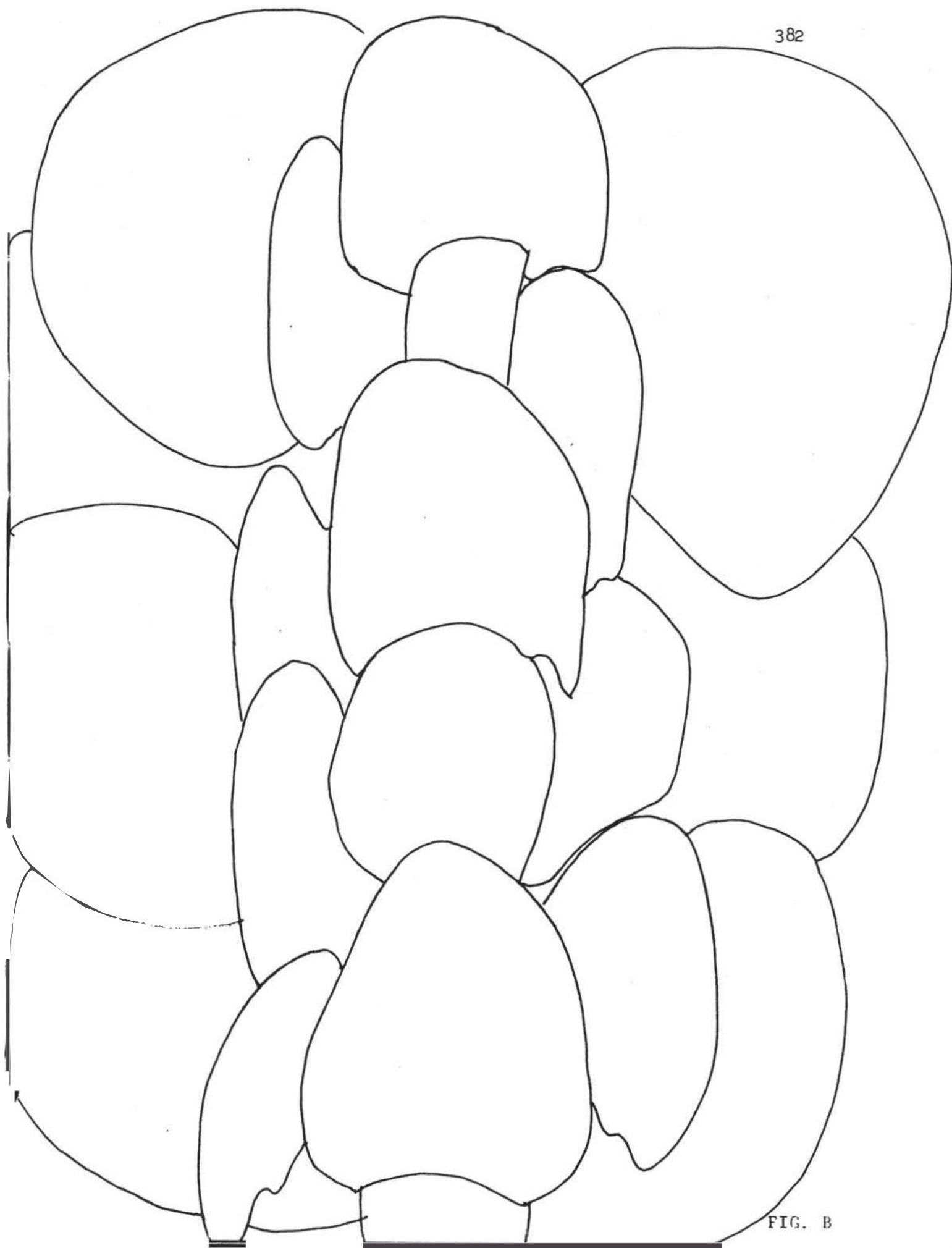


FIG. B

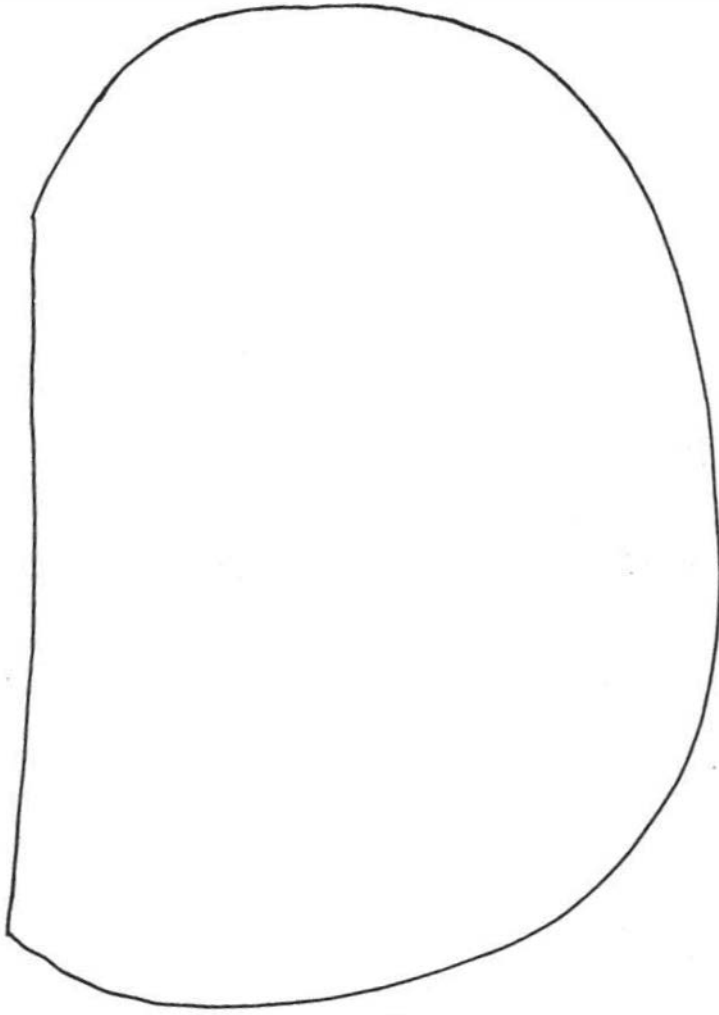


FIG. C

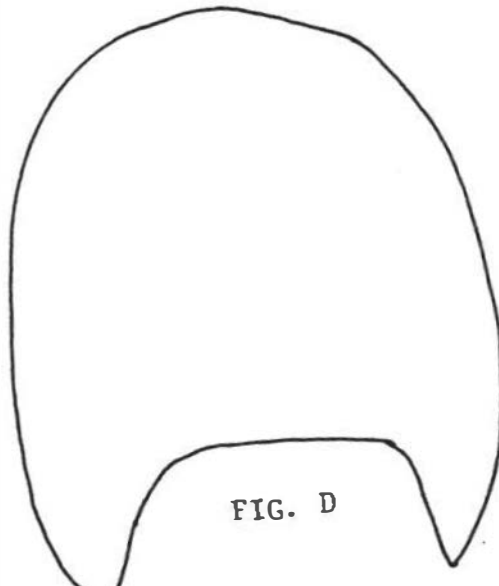
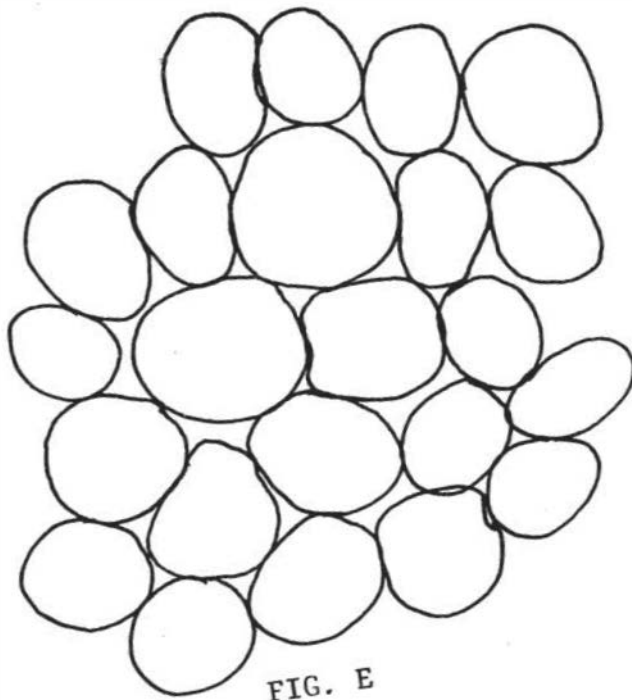


FIG. D



FAMILY: FRULLANIACEAE

Frullania asagrayana Mont.

Plants in patches or in pendulous tufts, green to reddish brown, leafy stems 0.7-1.4 mm. wide; stem prostrate to ascending or pendulous, 1-5 cm. long, 120-180 μ thick, 1-2 pinnate branches numerous; leaves imbricate; dorsal lobe of stem ovate, 525-750 μ long, 500-650 μ wide, dorsally convex, roundedly narrowed to hardly cordate at base; apex obtuse to rounded, bent toward the ventral side; margin entire, dorsal margin arching to farther edge of stem or up to stem width beyond it; ventral lobe of stem leaf at an angle of 0-45 degrees with the stem, 1/2-3/4 the width from the stem, obovoid, slightly constricted near the mouth, 175-250 μ long, 100-170 μ wide, stalk short; stylus often rather conspicuous, suborbicular to sub lanceolate, often the margin with 1 or 2 cilia; explanate ventral lobes on those leaves grading into female bracts; cells of middle of dorsal lobe of stem leaf 12-27 μ , of margin 10-16 μ , of base about 18 by 24-35 μ ; walls mostly thick; trigones large; paracysts about the same size as adjacent cells, but more reddish, or near base shorter, commonly in a vein-like row from base to middle, in some leaves in several rows, in occasional leaves scatter or wholly wanting; gemmae unknown; underleaves of stem distant to approximate, 2-lobed and often unequally so, shortly ovate to obovate, 250-525 μ long, 215-480 μ wide, rounded to mostly auriculate or apparently decurrent at base, lobes acute to obtuse or occasional ones rounded; sinus descending

1/4-2/5 the length, acute to obtuse; margins entire to sinuate except near base, often undulate; plants unisexual; male inflorescence a short lateral branch, ovoid; male bracts 12-20; female inflorescence terminal on a short lateral branch; female bracts 2-lobed with the dorsal half the larger: dorsal half somewhat arcuate, ovate to elliptic, 0.9-1.5 mm. long, 350-700 μ wide; sinus descending 1/2-2/3 the bract length; apex acute; margin entire or somewhat dentate: ventral half lnaceolate, 640-860 μ long as measured to insertion on stem, 210-290 μ wide; apex acuminate; margins usually revolute, entire for a tooth or segment or the stylus on the ventral margin; female bracteole free or connate with 1 bract, 2-lobed with sometimes an additional appendage or lobe on the lower part of each margin, ovate, 650-860 μ long, 250-540 μ wide; apical lobes narrow, acuminate; sinus descending 1/2-3/5 the length, acute to acuminate; margins entire to sinuate or occasionally with a tooth or two exclusive of the basal appendages, appendages and margin below them commonly variously toothed or lobed; perianth about 2/4-emergent, dorsally flattened, ellipsoid to obovoid, 1.4-1.9 mm. long, 0.9-1.1 mm. wide not tuberculate, rounded to beak; keels dorsal, 2 lateral, 1 ventral; beak 2-3 times as long as thick.

Habitat: On rocks, bark of trees, and shrubs, rotten wood, sometimes pendulous from small branches.

Illinois distribution: Coles, Jackson, Menard, Pope, St. Clair, Saline, and Shelby Counties.

Frullania asagrayana Mont.

Fig. A - Dorsal view - 40 X.

Fig. B - Ventral view - 40 X.

Fig. C - Leaf - 160 X.

Fig. D - Leaf cells - 400 X.

Fig. E - Underleaf - 160 X.

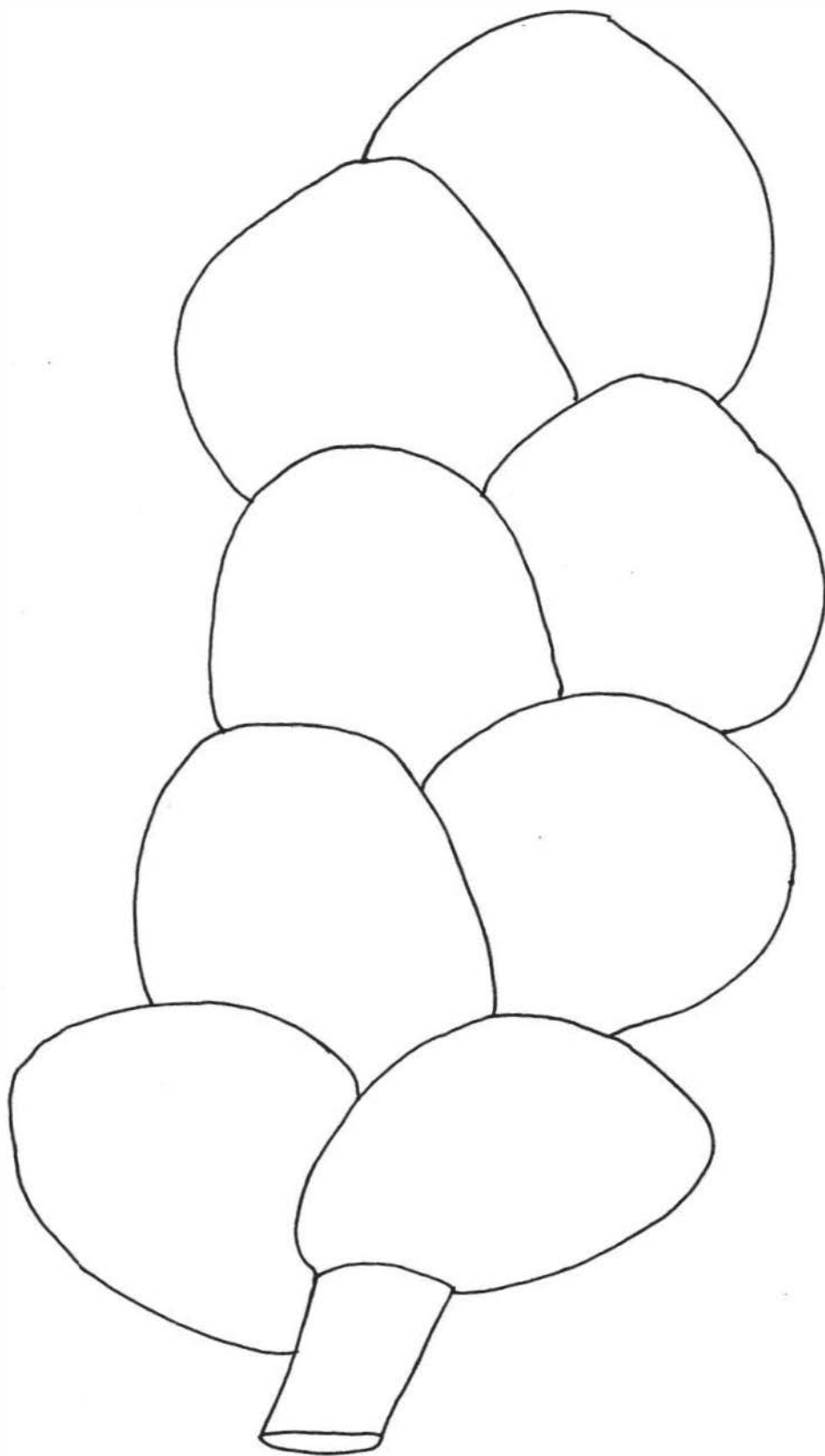


FIG. A

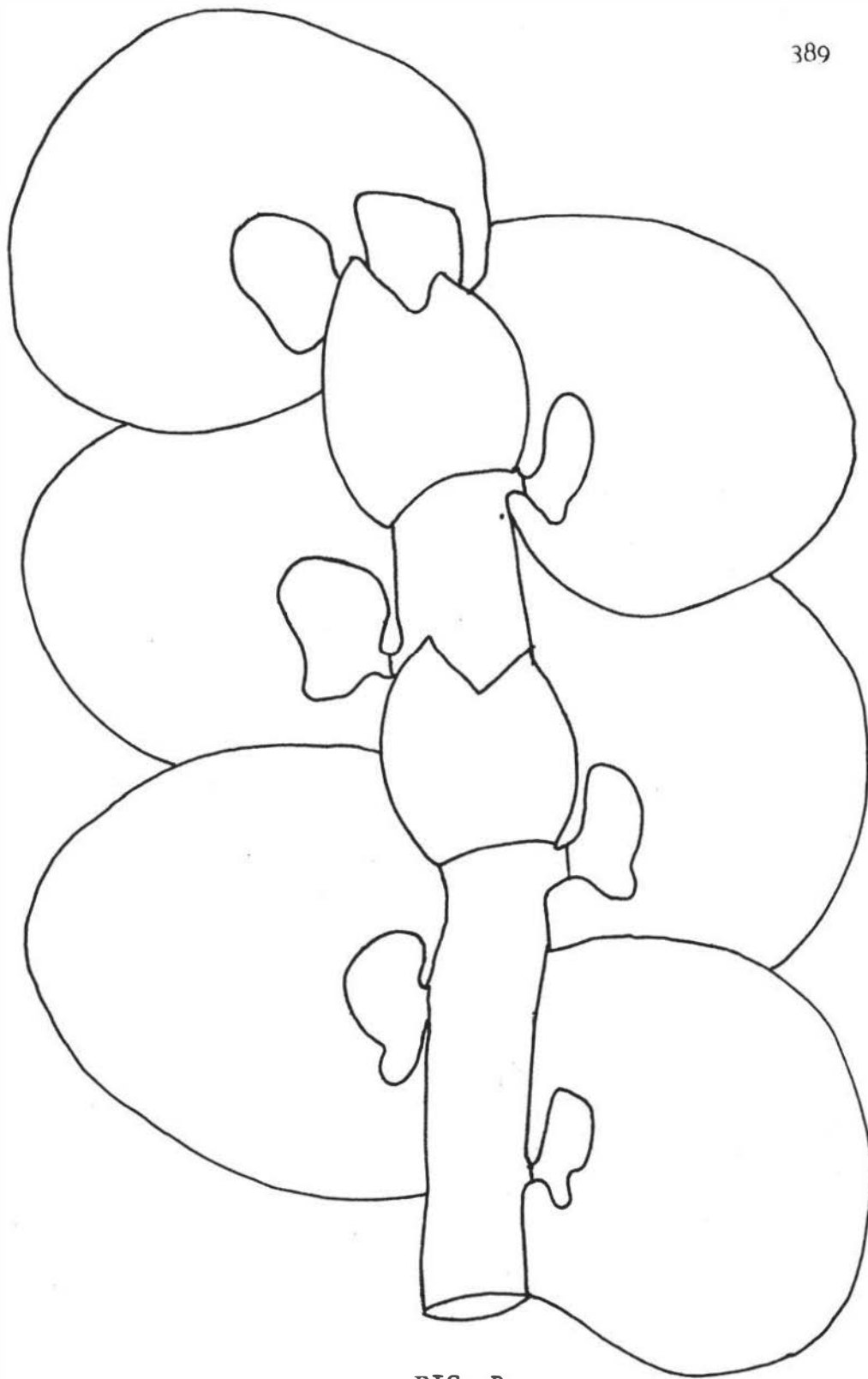


FIG. B

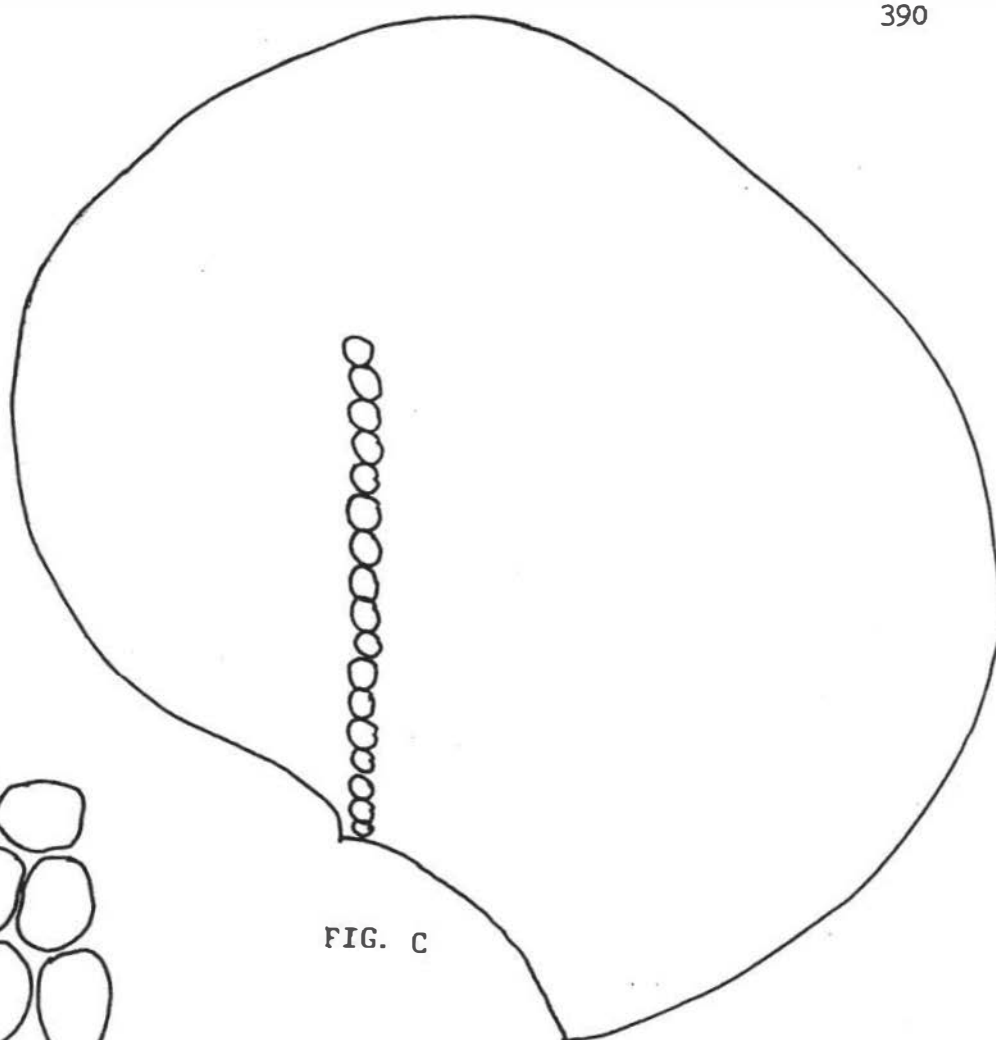


FIG. C

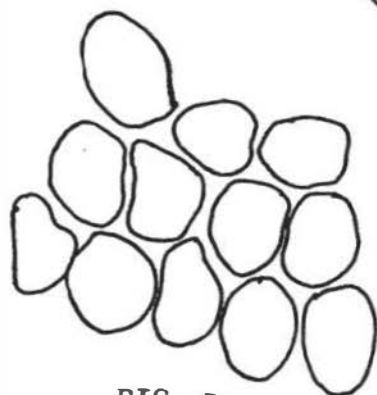


FIG. D

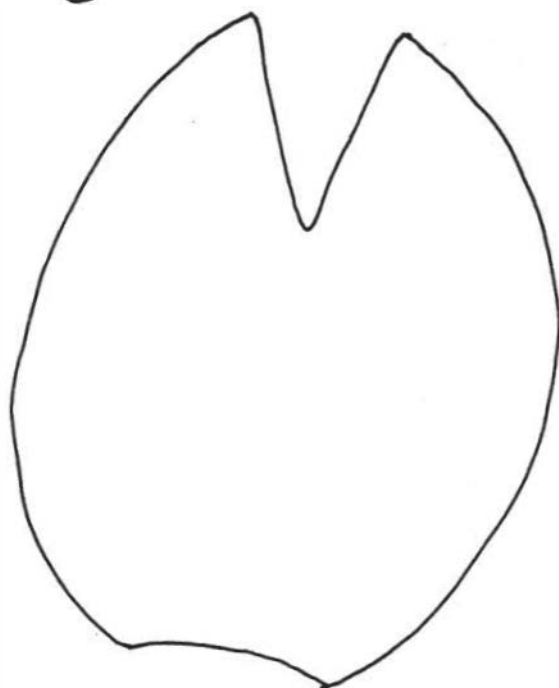


FIG. E

FAMILY: FRULLANIACEAE

Frullania eboracensis Gottsche

Dioicous; plants closely appressed to matrix, green stems pennate; leaves imbricated, the lobes suborbicular, arching over stem and cordate at base, rounded at the slightly recurved apex, entire; locule galeate, truncate at base, separated from stem by about $1/6$ its width; stylus minute, 2 or 3 cells wide at base; underleaves distant, ovate bifid about $1/3$ with subacute lobes and sinus, entire or obscurely unidentate on the sides; leaf-cells of lobe rather thick-walled with trigones and intermediate thickenings, the latter becoming fewer toward base; female inflorescence terminal on stem or a main branch; bracts in 2 or 3 pairs, unequally bifid, the lobe ovate, rounded at apex, entire or slightly crenulate toward base; lobule narrower than the lobe, ovate, bearing a small tooth-like segment or stylus at about the middle, otherwise subentire; bracteole free or connate on one side with acute lobes and sinus, entire on sides; perianth obovate or obcuneate, more or less compressed, abruptly narrowed into a short, broad beak with distinct, sometimes two-angled postical keel but without distinct supplementary ridges, smooth or slightly roughened on lateral keels, male spike oblong, occupying a short lateral branch, bracts in many pairs.

Habitat: Tree bark.

Illinois distribution: Clark, Coles, Cook, Fulton, Jackson, LaSalle, Menard, Peoria, St. Clair, Sangamon, Shelby, and Union Counties.

Frullania eboracensis Gottsche

Fig. A - Dorsal view - 40 X.

Fig. B - Ventral view - 40 X.

Fig. C - Leaf - 160 X.

Fig. D - Underleaf - 160 X.

Fig. E - Leaf cells - 400 X.

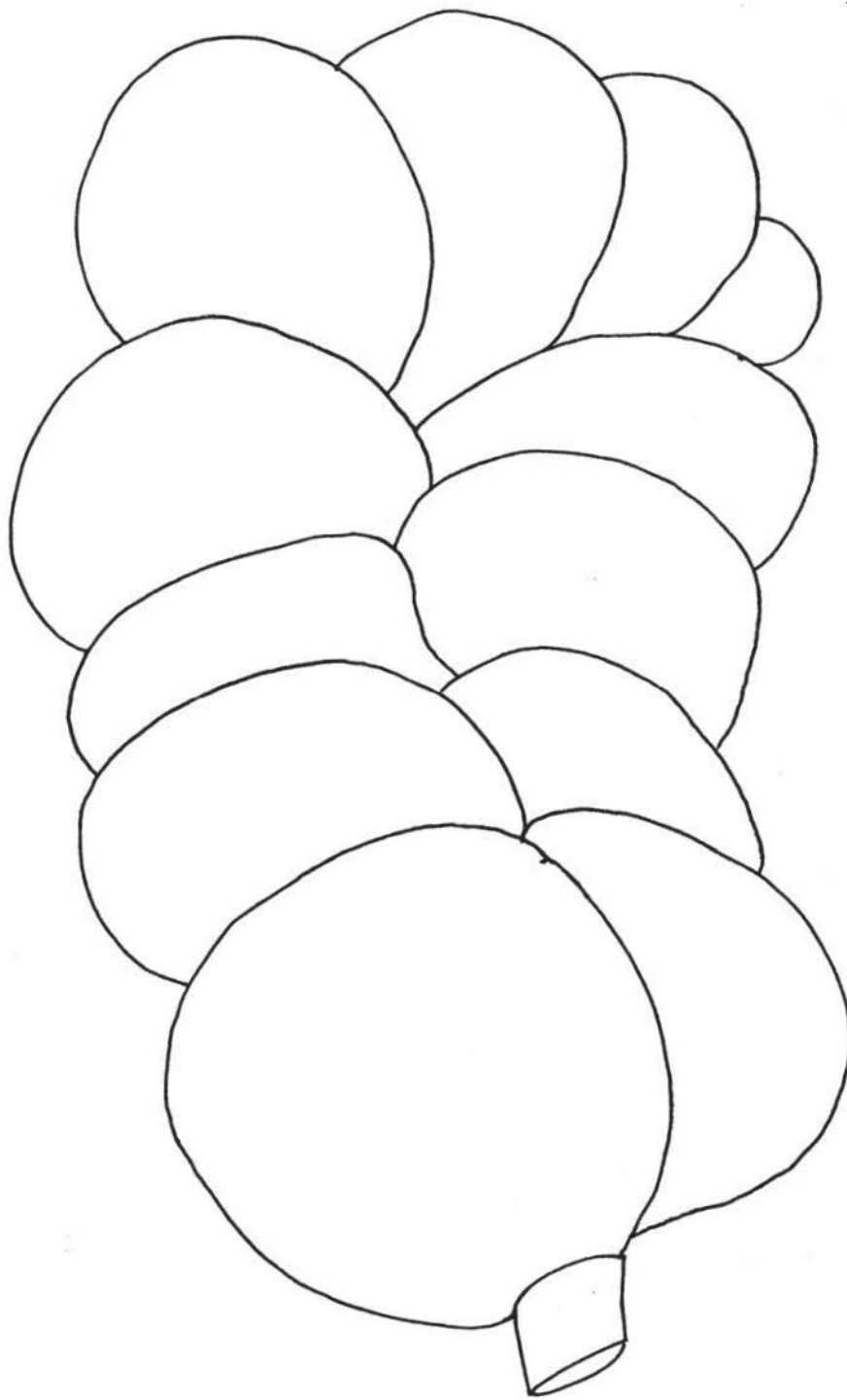


FIG. A

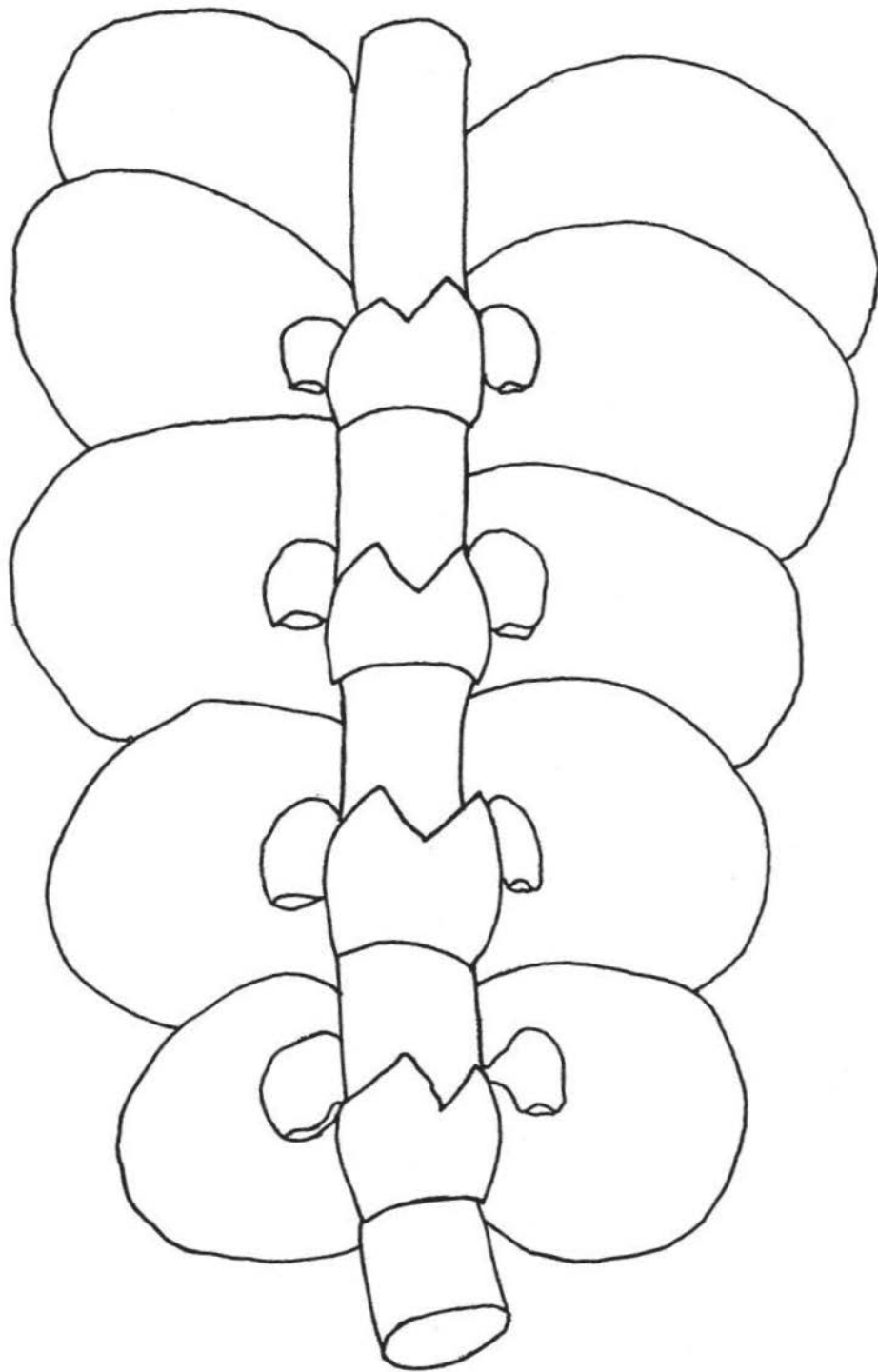


FIG. B

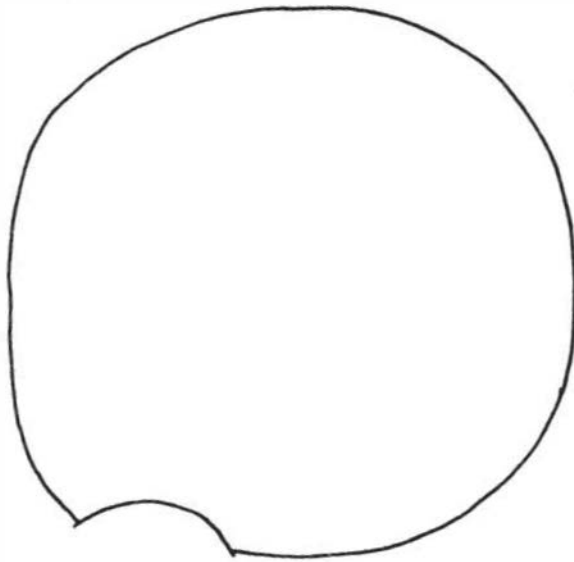


FIG. C



FIG. D

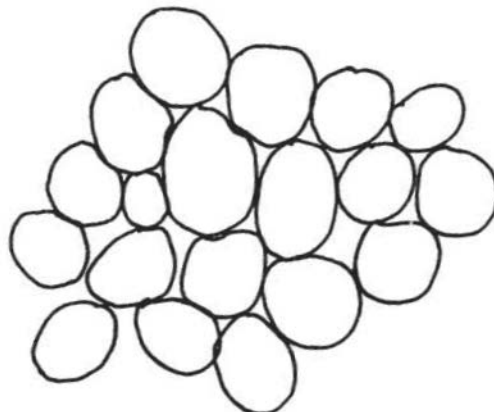


FIG. E

FAMILY: FRULLANIACEAE

Frullania inflata Gottsche

Autoicous; plants closely appressed, brownish green to reddish; stems irregularly pinnate; leaves imbricated, the lobes orbicular, arching over the stem but not cordate at base, decurved at rounded apex, entire; lobule galeate, truncate at base, inflated in upper and outer parts; stylus minute, subulate; underleaves distant, orbicular or obovate, bifid about 1/3 with acute or obtuse lobes and sinus, entire or nearly so; leaf cells of lobe rather thick-walled with inconspicuous trigones and no intermediate thickenings; male inflorescence terminal on the stem or main branch; bracts in 2 or 3 pairs unequally bifid, the lobe ovate to obovate, rounded at apex, entire, lobule shorter and narrower than the lobe, ovate, rounded to subacute at apex, bearing a small tooth or stylus below the middle of the inner edge, elsewhere entire; bracteole free from bracts, ovate, deeply bifid with acute to obtuse lobes and sinus, entire or bearing one or 2 minute teeth toward the base; perianth exserted, more or less compressed when young, inflated when old, obovate, abruptly narrowed into a short, broad beak, with a distinct angles, postical keel and usually with 1 or more supplementary antical or postical ridges; male bracts in about 2 pairs, occupying a short lateral branch near the involucre and forming a short ovoid spike.

Habitat: Rocks, trees, and fences.

Illinois distribution: Clark, Coles, Gallatin, Jackson, Shelby, and Union Counties.

Frullania inflata Gottsche

Fig. A - Dorsal view - 40 X.

Fig. B - Ventral view - 40 X.

Fig. C - Leaf cells - 400 X.

Fig. D - Underleaf - 400 X.

Fig. E - Leaf - 160 X.

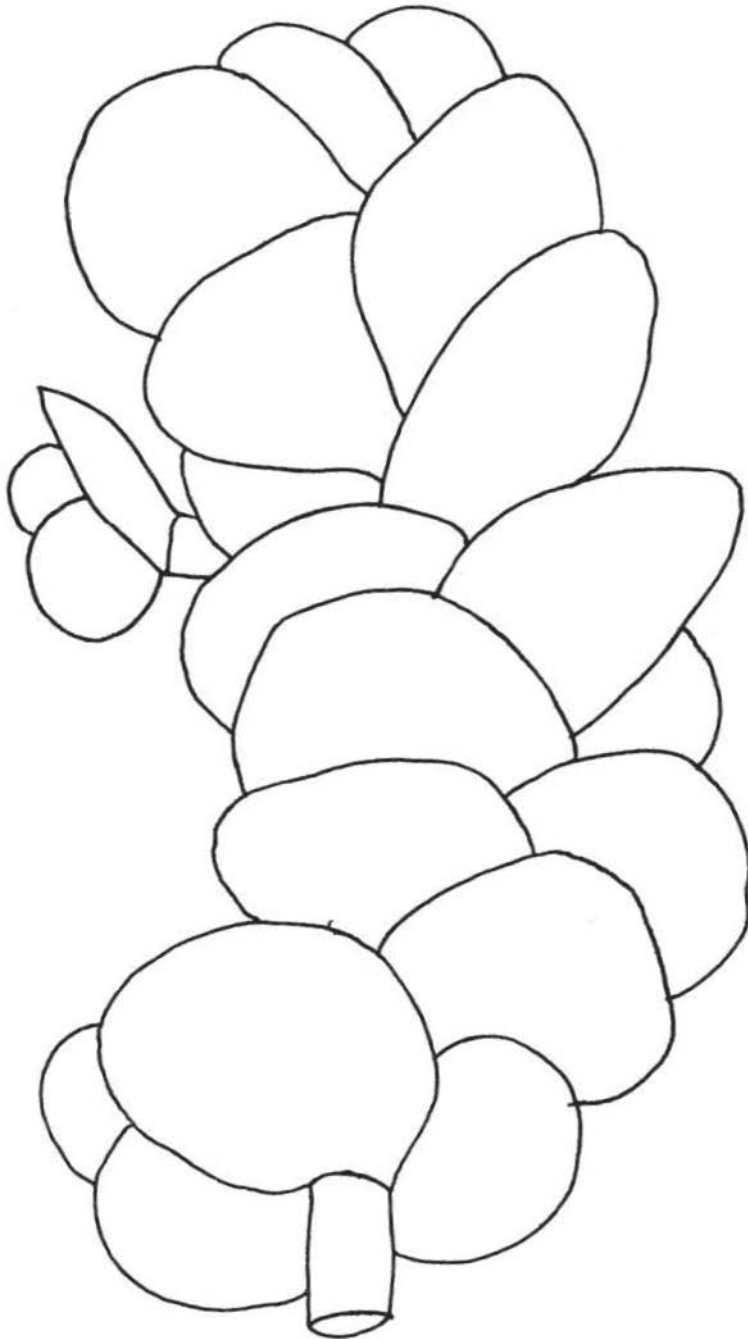


FIG. A

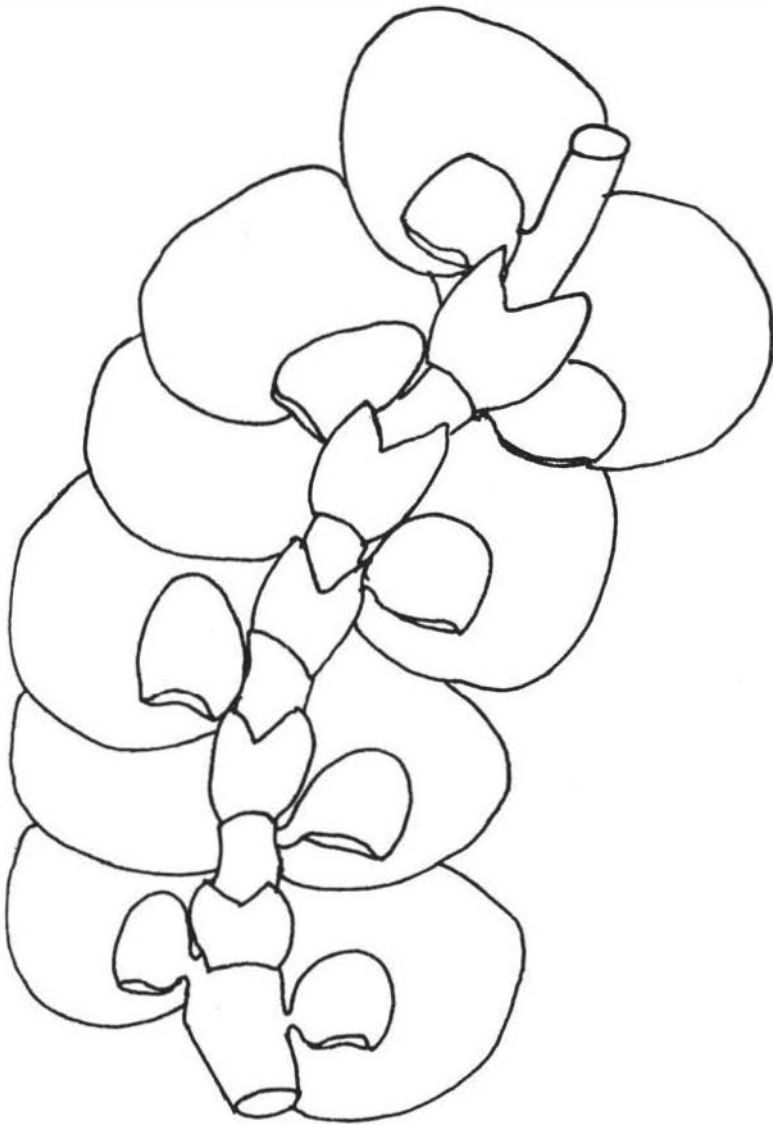


FIG. B

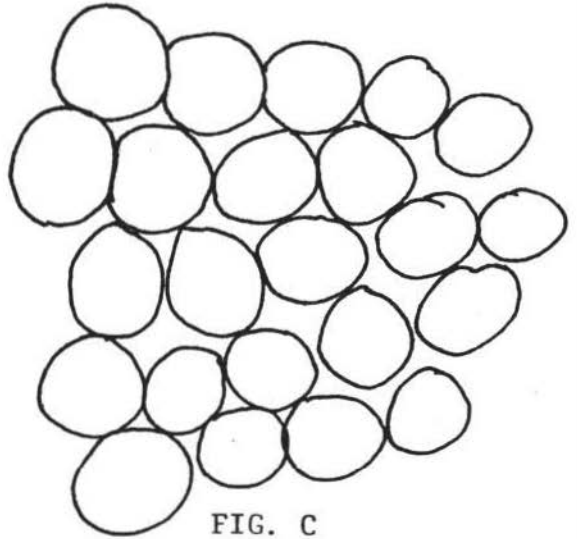


FIG. C



FIG. D

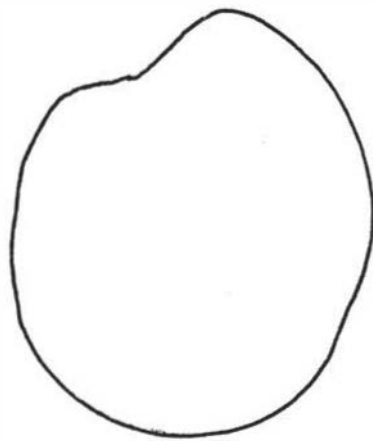


FIG. E

FAMILY: PELLIACEAE

Pellia epiphylla (L.) Corda

Thalli prostrate, forming mats, dark green, sometimes tinged with purplish red; branches few and dichotomous, 1-7 cm. long, 10-15 mm. wide, cordate at tip, firm, not collapsing, vein wide, convex on under side, gradually thinning toward margin; rhizoids numerous, brownish; cross section 11-15 cells thick in the middle; cells with numerous oil bodies, some near middle with thick violet red vertical interlacing thickenings in the walls; in median longitudinal section these mostly as vertical band-like thickenings in the cells; thalli bisexual; antheridia directly behind the archegonia, the papilla over each antheridial cavity visible to the naked eye usually as a red point; involucre in the form of a scale-like flap on the posterior side of the pocket-like cavity from which the calyptra arises incised at the free margin; calyptra arcuate, tubular-clavate, wider above, partly rose red, very large, emerging perhaps half its length from the involucre, roughened with scattered 2-celled hairs; seta hyaline, up to 5 cm. long, sporangium globose, dark olive green, its wall composed of 2-3 layers of cells; epidermal cells of the sporangium wall larger than the others, hexagonal, with nodular thickenings; inner layer of cells of the sporangium wall elongate, with numerous semi-annular thickenings; elater bearers 20-30, 2-4 spirals, 15-25 μ thick, attached to the base of the sporangium and forming a bushy or columnar projection; elaters very long and narrow, contorted, about 8 μ wide and 500 μ long, their spirals mostly 2, yellow; spores about 75 x 100 μ ; oblong-oval, yellowish green, muriculate.

Habitat: On wet ground in springy places, or on moist ground in shade.

Illinois distribution: Clark, Coles, DuPage, Jackson, LaSalle, Marion, Menard, St. Clair, Shelby, Union, and Wabash Counties.

Pellia epiphylla (L.) Corda

(Redrawn from Frye and Clark, 1937-1947.)

Fig. A - Thallus - 175 X.

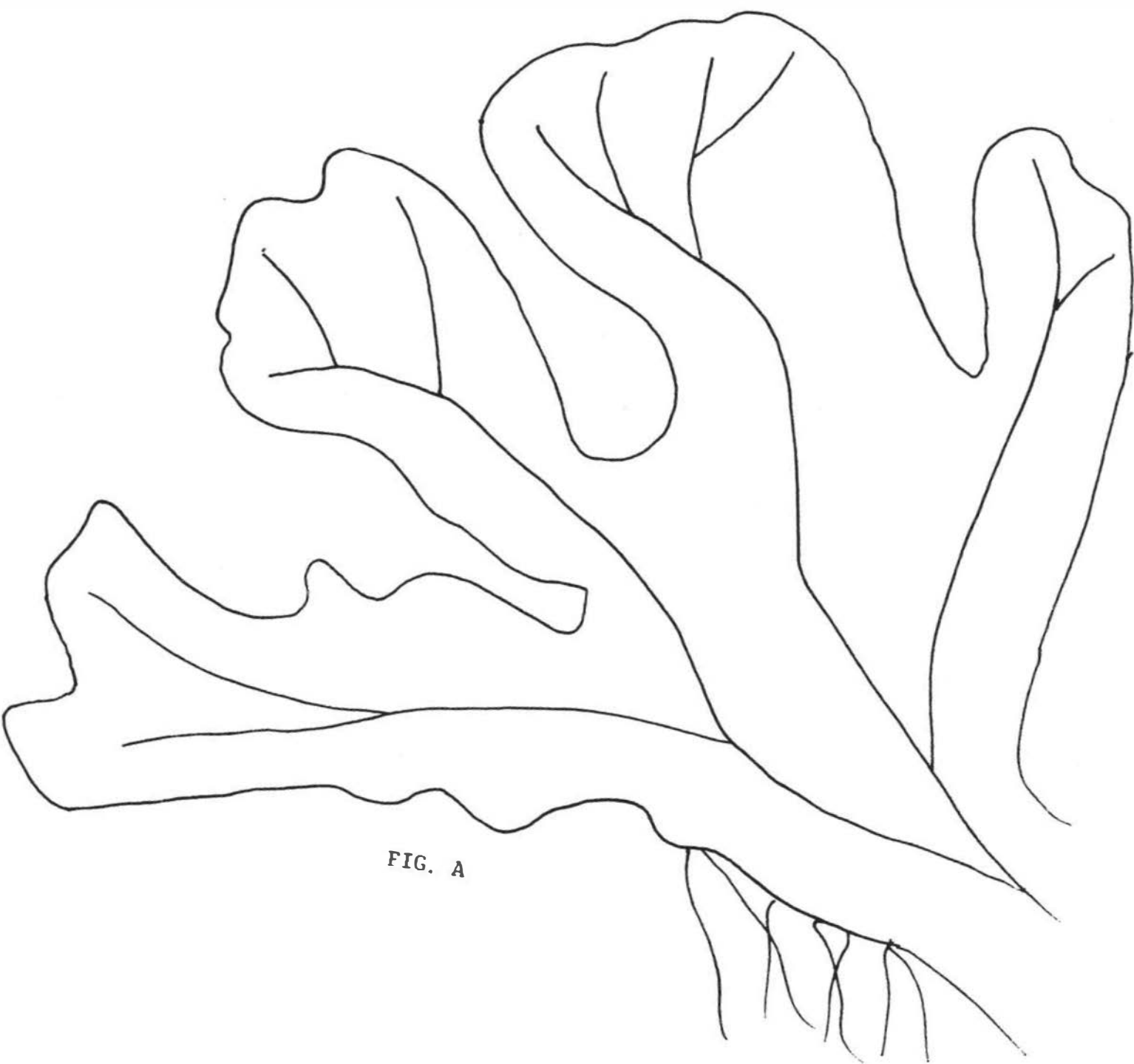


FIG. A

FAMILY: MARCHANTIACEAE

Asterella tenella (L.) Beauv.

Thalli mostly 0.5-1.5 cm. long and 1.5-3 mm. wide, branching almost invariably dichotomous, bright green, often purplish along margins and beneath; gemmae none; vein constituting a rounded ventral keel; margin thin, undulate, purplish; ventral scales appendiculate; appendages 1-2, narrowly to broadly ovate, mostly 250-450 μ long and 150-300 μ wide, acute to rounded, entire or somewhat dentate, dorsal epidermal cells averaging about 25 x 40 μ , their walls slightly thickened, sometimes with distinct trigones; air chambers not subdivided by supplementary partitions; green tissue loose; pores 1 per chamber, slightly or not at all elevated, surrounded by 6 radiating rows of 2-3 cells each; radial walls about the pore thin; antheridial receptacle hardly distinct, sessile, the antheridia merely a group anterior to the female receptacle, female receptacles stalked; stalk naked, often purple, about 2 cm. long; disk 2-4 mm. wide, hemispheric, smooth or nearly so, shortly lobed; its lobes mostly 4, extending obliquely downward; involucre deeply 2-lipped, entire to irregularly sinuate or crenate; pseudoperianth mostly 8-10 cleft, white or yellowish or purplish; the segments finally free, ovate to lanceolate; sporangium with lid which remains intact at dehiscence; elaters mostly 10-12 μ wide, yellow, with 2 spirals in the middle, and one at the ends; spores mostly 80-90 μ , yellow; wing margins undulate, 8-15 μ wide; outer face reticulate, with fine irregular lines and coarse ridges, the meshed 16-18 μ wide; inner faces similar but the reticulations incomplete.

Habitat: On wet banks, damp ground in sandy fields, and on damp rocks in the lowlands.

Illinois distribution: Clark, Coles, Cook, Fulton, Johnson, Knox, Menard, Peoria, Shelby, and Union Counties.

Asterella tenella (L.) Beauv.

(Redrawn from Frye & Clark - 1937-1947.)

Fig. A - Thallus - 7 X.

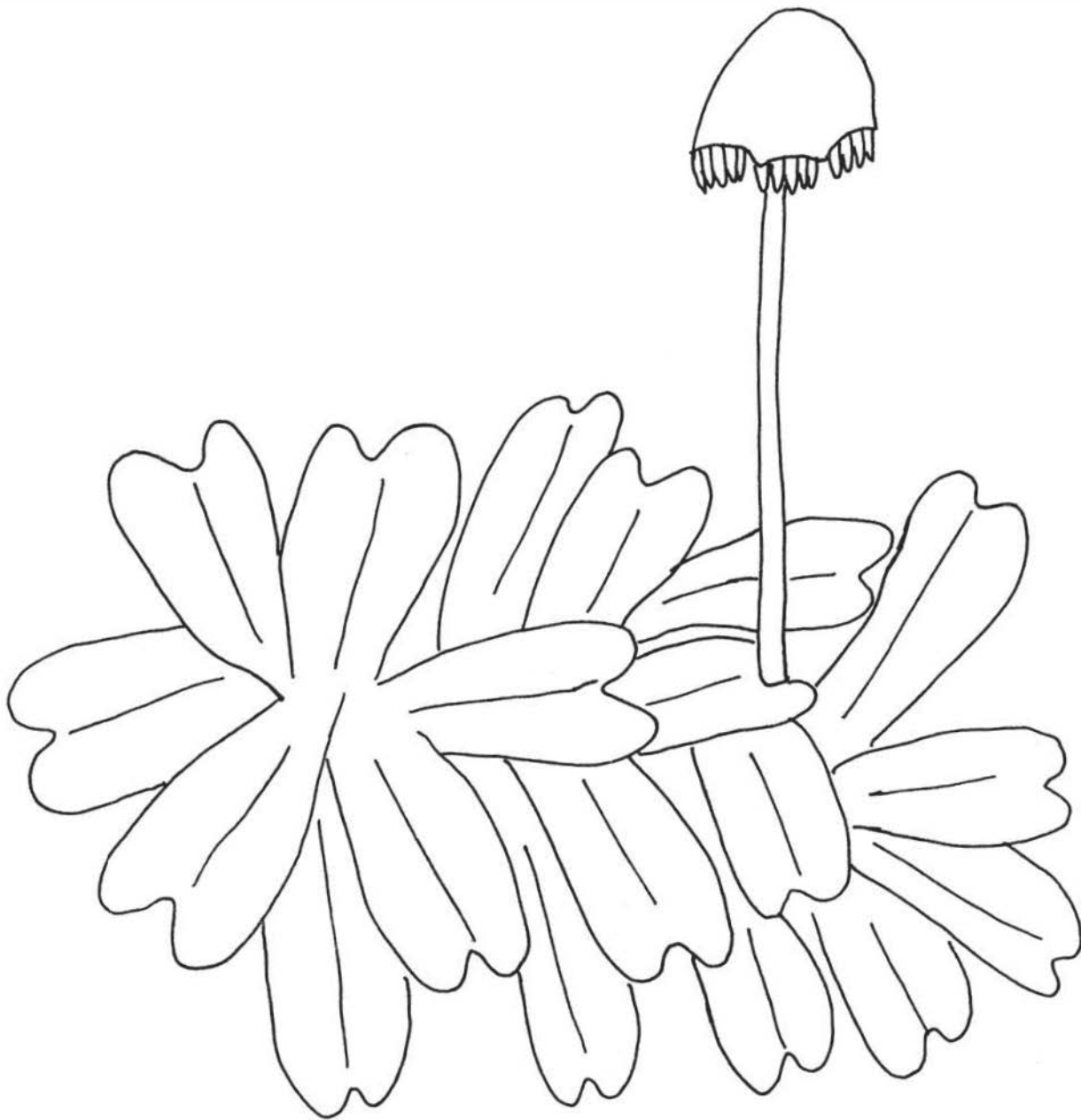


FIG. A

FAMILY: MARCHANTIACEAE

Conocephalum conicum (L.) Wiggers

Thalli mostly 10-20 cm. long and 1-2 cm. wide, thin, firm, green; upper surface with quite distinct polygonal areas with one pore each; ventral scales appendiculate, appendages orbicular to reniform, mostly 300-500 μ long, entire, marginal cells forming a more or less distinct border; dorsal epidermal cells averaging about 30 x 100 μ ; air chambers with green filaments of which the end cells when near the pores are colorless and elongate or pyriform; pores surrounded by several rows of cells with strongly out-curved walls; ventral tissue of conspicuously pitted cells, with a few large slime cells; antheridial receptacle about 5 mm. wide; female receptacles stalked; stalk 5-10 cm. long, disk about 5 mm. high; elaters irregular, sometimes branched, mostly 12-20 μ wide; spores mostly 70-100 μ , ellipsoid, multicellular, green.

Habitat: On damp soil or wet rocks, in damp air.

Illinois distribution: Champaign, Clark, Coles, Cook, Fulton, Jackson, Kankakee, LaSalle, Menard, Peoria, St. Clair, Shelby, and Union Counties.

Conocephalum conicum (L.) Wiggers

Fig. A - Thallus - 4 X.

Fig. B - Archegonium - 21 X.

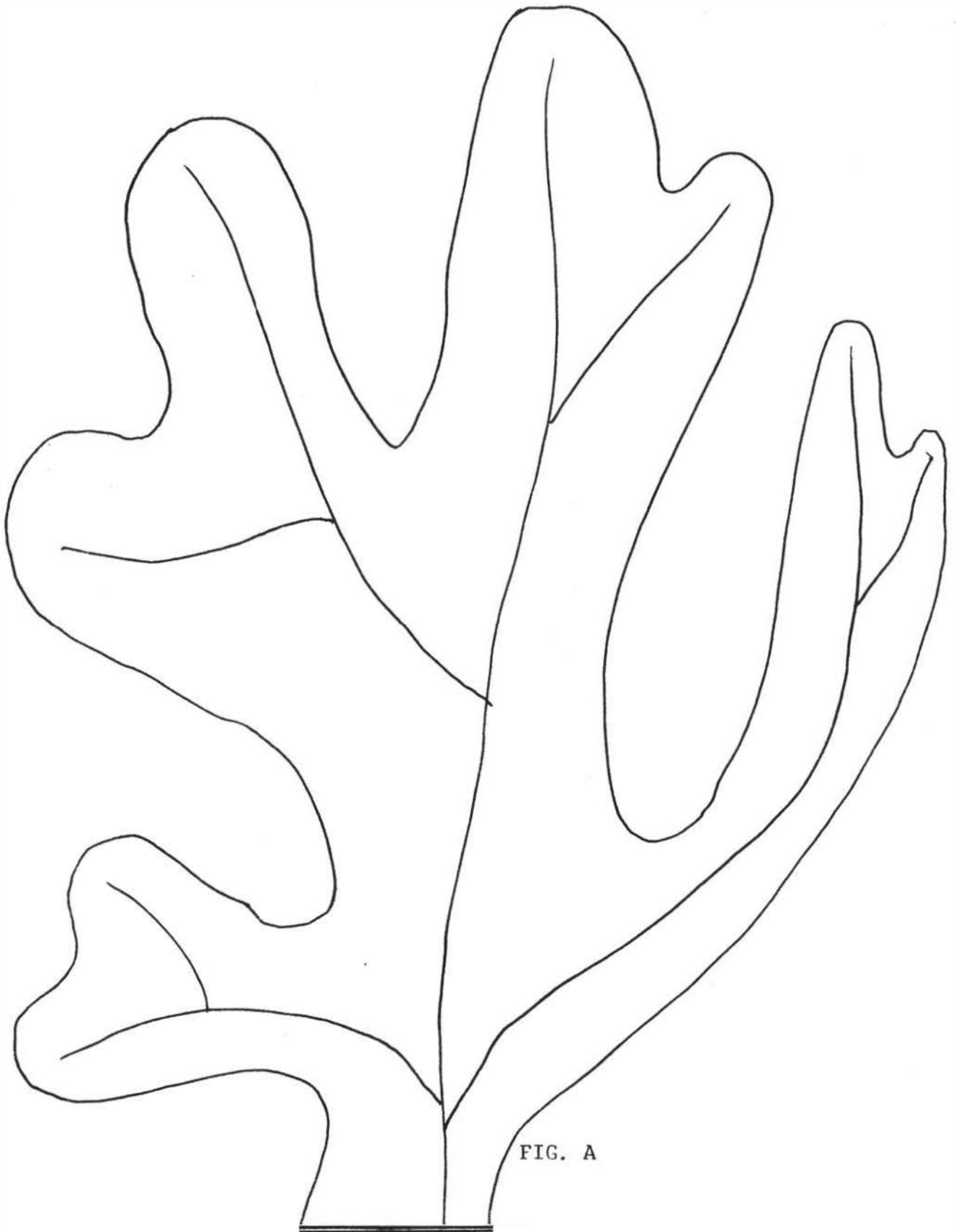


FIG. A

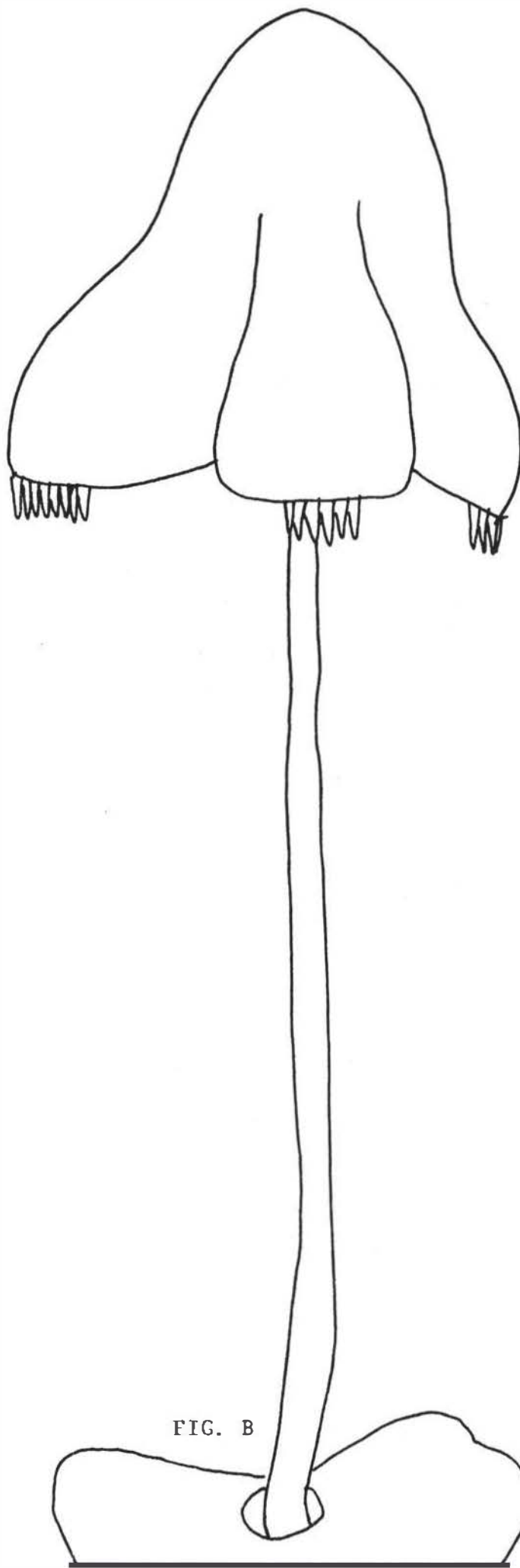


FIG. B

FAMILY: MARCHANTIACEAE

Reboulia hemisphaerica (L.) Raddi

Thalli mostly 1-3 cm. long and 6-7 mm. wide, usually green in middle region and brownish purple along the sides and beneath; vein constituting a narrow roundish keel; margin thin, undulate, scarcely or not at all incurved when dry, dorsal epidermis without oil cells; its cells averaging about $30 \times 50 \mu$, the trigones usually bulging into the cells; pores elevated, the radiating rows about them usually of 4-5 cells each; ventral tissue largely restricted to the keel; appendages of the ventral scales 2-3, narrowly linear-lanceolate or linear, mostly 700-900 μ long and 60-100 μ wide, long acuminate, entire, composed of larger cells than the rest of the scale; thalli unisexual or bisexual; antheridial receptacle sometimes at the stalk of the female receptacle, sometimes terminating a separate branch, oval to broadly lunate, often deep purple; female receptacle stalked; the stalk with a cluster of slender bractlets at base and at apex, mostly 1.5-3 cm. long, more or less colored below; disk mostly 3-4 mm. wide; sporangium green; elaters yellow, mostly 10-12 μ wide, with 2-3 spirals; spores mostly 60-80 μ wide; faces minutely punctulate, coarsely and rather regularly reticulate; reticulations mostly 16-20 μ wide.

Habitat: On rocks, walls and earth.

Illinois distribution: Clark, Coles, Fulton, Gallatin, Jackson, Johnson, LaSalle, Menard, Peoria, Pope, Randolph, Shelby, and Union Counties.

Reboulia hemisphaerica (L.) Raddi

(Redrawn from Frye and Clark, 1937-1947.)

Fig. A - Thallus - 6 X.

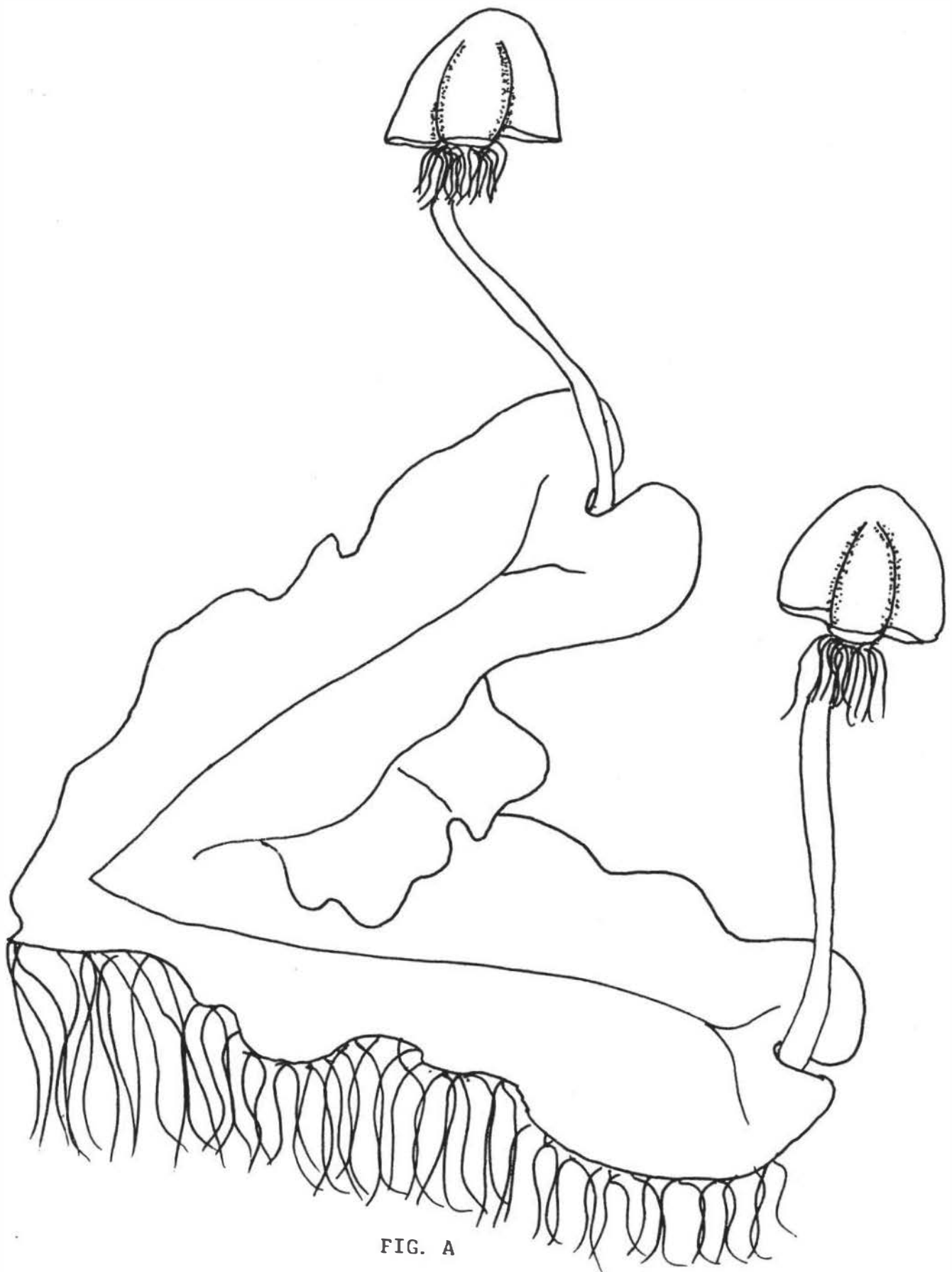


FIG. A

FAMILY: ANTHOCEROTACEAE

Phaeoceros laevis (L.) Prosk.

Thallus when not crowded a circular rosette, flat or nearly so, dark green, 0.5-3 cm. in diameter, deeply lobed; lobes irregular, not undulate; margins crenate, occasionally some of the them bent upward; dorsal surface smooth, occasionally with a few ascending lobes or lamellae; costa wanting; cells of dorsal epidermis distinctly smaller than those of the interior, 30-105 μ by 24-40 μ , rhombic to hexagonal; thallus 6-10 cells thick in median region, 2-3 cells thick along margin; interior cells hyaline; interior hollows wanting; glandular thickenings occasional along the margin; thalli bisexual; antheridia 1-3 in each antheridial cavity, 100-200 μ thick; involucre solitary or occasionally in pairs, cylindric but slightly narrowed upward, 0.8-3.5 mm. long, 0.4-1.3 mm. thick, smooth or plicate; mouth rarely scarious, entire to slightly lobed, often flaring at maturity; sporangia moderately numerous, filiform, 1-3.5 cm. long, 250-500 μ thick; stomates 70-77 μ long, 25-30 μ wide; elaters of 1-4 cells, geniculate, often branched, 25-45 μ long; spiral hardly present, the thickening a longitudinal or diagonal band; spores greenish yellow to yellow, 30-40 μ , densely granulate to papillate especially on the outer convex face.

Habitat: On moist ground or on wet rocks.

Illinois distribution: Clark, Coles, Fulton, Jackson, LaSalle, Menard, Peoria, Pope, Shelby, and Union Counties.

Phaeoceros laevis (L.) Prosk.

(Redrawn from Frye and Clark, 1937-1947.)

Fig. A - Thallus - 12 X.

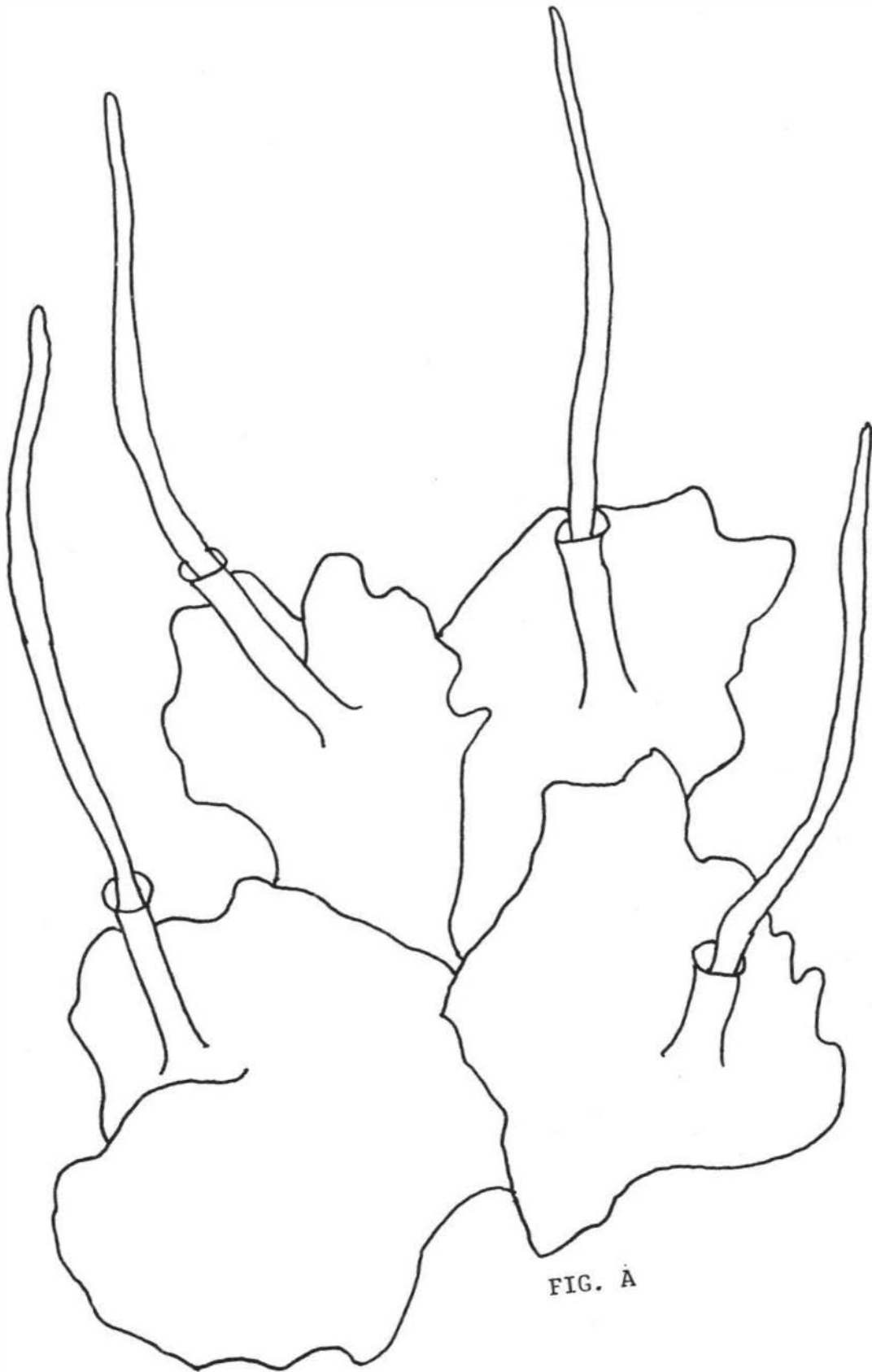


FIG. A

DISCUSSION

Collections made on unshaded soils represented far fewer bryophyte species than those collected on soil under shaded conditions. On soil exposed to direct sunlight, the species collected were: Physcomitrium turbinatum (Mx.) Brid., Dicranella varia (Hedw.) Schimp., Brachythecium oxycladon (Brid.) J.&S., and Bryum cuspidatum (B.S.G.) Schimp. The last three species were much more frequent than P. turbinatum (Mx.) Brid., which was collected only in early spring at the time it was fruiting. On shaded soil, the bryophytes collected were: Ditrichum pallidum (Hedw.) Hampe, Bryum caespiticium Hedw., Entodon seductrix (Hedw.) C. Muell., Leptodictyum riparium (Hedw.) Warnst., Dicranella varia (Hedw.) Schimp., Bryum pseudotriquetrum (Hedw.) Schwaegr., Brachythecium salebrosum (W.&M.) B.S.G., Amblystegium varium (Hedw.) Lindb., Pogonatum pensylvanicum (Hedw.) Paris, Bryhnia graminicolor (Brid.) Grout, Plagiothecium deplanatum (Sull.) Grout, Chamberlainia acuminata (Hedw.) Grout., Bryum cuspidatum (B.S.G.) Schimp., Eurhynchium serrulatum (Hedw.) Lindb., Hypnum arcuatum Lindb., Atrichum angustatum (Brid.) B.S.G., Ceratodon purpureus (Hedw.) Brid., Brachythecium oxycladon (Brid.) J.&S., Anomodon minor (Beauv.) Lindb., Pleuridium subulatum (Hedw.) Lindb., Brotherella recurvans (Mx.) Fleisch., Mnium cuspidatum Hedw., Grimmia apocarpa Hedw., Campylium hispidulum (Brid.) Mitt., Plagiothecium denticulatum (Hedw.) B.S.G., Plagiothecium geophilum (Aust.) Grout, Bryum argentum Hedw., Eurhynchium hians (Hedw.) J.&S., Amblystegium

serpens (Hedw.) B.S.G., Fissidens taxifolius Hedw., and Atrichum undulatum Web. and Mohr. Of the species growing in areas where less sunlight was available, Brachythecium oxycladon (Brid.) J.&S., Brachythecium salebrosum (W.&M.) B.S.G., Atrichum angustatum (Brid.) B.S.G., and Mnium cuspidatum Hedw. were most frequently found; whereas, only one collection was made of Brotherella recurvans (Mx.) Fleisch. and Fissidens taxifolius Hedw. Other bryophytes less frequently found were: Ceratodon purpureus (Hedw.) Brid., Grimmia apocarpa Hedw., Campylium hispidulum (Brid.) Mitt., Pleuridium subulatum (Hedw.) Lindb., and Plagiothecium geophilum (Aust.) Grout.

The bryophytes inhabiting creek and river banks included several different species from those found on shaded soils and soils exposed to sun. Those on the creek banks were: Brachythecium oxycladon (Brid.) J.&S., Bryum cuspidatum (B.S.G.) Schimp., Dicranella varia (Hedw.) Schimp., Amblystegium varium Lindb., Entodon cladorrhizans (Hedw.) C. Muell., Astellia tenella (L.) Beauv., Eurhynchium serrulatum (Hedw.) Lindb., Eurhynchium hians (Hedw.) J.&S., Mnium affine Bland., Leptodictyum riparium (Hedw.) Warnst., Mnium punctatum Hedw., Bryhnia graminicolor (Brid.) Grout, Amblystegium serpens (Hedw.) B.S.G., Leskea gracilescens Hedw., Mnium affine Bland. var. rugicum (Laur.) B.S.G., Atrichum angustatum (Brid.) B.S.G., Fissidens bushii (Card. & Ther.) Card. & Ther., Drepanocladus aduncus Hedw. var. kneiffii (B.S.G.) Warnst., Pellia epiphylla (L.) Ccrda., Hygroamblystegium irriguum (Wils.) Leoske, Lophocolea heterophylla (Schrader.) Dum., Physcomitrium turbinatum (Mx.) Brid., Anomodon rostratus (Hedw.) Schimp., Anomodon minor (Beauv.) Lindb., Bryum pseudotriquetrum (Hedw.) Schwaegr., Fissidens taxifolius Hedw., Ephemerum serratum (Hedw.) Hampe, Mnium cuspidatum Hedw., Brachythecium salebrosum (W.&M.) B.S.G.,

Aphanorhegma serratum (H.&W.) Sull., and Pohlia wahlenbergii (W.&M.) Andrews. Of all the creek-bank inhabiting mosses, Brachythecium oxycladon (Brid.) J.&S., Eurhynchium serrulatum (Hedw.) Lindb., Leptodictyum riparium (Hedw.) Warnst., Anomodon rostratus (Hedw.) Schimp., and Mnium cuspidatum Hedw. were found to be the most frequently collected species on creek banks. Aphanorhegma serratum (H.&W.) Sull., Entodon cladorrhizans (Hedw.) C. Muell., Fissidens bushii (Card. & Ther.) Card. & Ther., Ephemerum serratum (Hedw.) Hampe, Lophocolea heterophylla (Schrad.) Dum., and Fissidens taxifolius Hedw. occur in much less frequency. Anomodon rostratus (Hedw.) Schimp., and Eurhynchium serrulatum (Hedw.) Lindb. occur along the banks of the Kaskaskia River in abundance.

Those hydrophytic bryophytes occupying niches in which periodic inundation occurs were: Pohlia wahlenbergii (W.&M.) Andrews (on partially submerged rocks in streams), Hygroamblystegium irriguum (Wils.) Loeske (on soil at edge of water in streams), Amblystegium serpens (Hedw.) B.S.G. (on soil at edge of water line), Fissidens bushii (Card. & Ther.) Card. & Ther. (on partially submerged rocks in streams), Amblystegium varium (Hedw.) Lindb. (on soils at edge of the water), Brachythecium salebrosum (W.&M.) B.S.G. (at edge of the water line), Leptodictyum riparium (Hedw.) Warnst. (at edge of the water line), Pohlia nutans (Hedw.) Lindb. (on partially submerged rocks in creeks), Amblystegium juratzkanum Schimp. (on soil of creek; above water line), Fissidens minutulus Sull. (on partially submerged rocks in creeks), Fissidens exiguus Sull. (on partially submerged rocks in streams), and Eurhynchium hians (Hedw.) J.&S. (on soil at the edge of the water line). Of these bryophytes, Amblystegium serpens (Hedw.) B.S.G., Amblystegium

varium (Hedw.) Lindb., and Leptodictyum riparium (Hedw.) Warnst. were found most frequently. Less frequent in occurrence were Amblystegium juratzkanum Schimp., Fissidens minutulus Sull., Fissidens exiguus Sull., and Fissidens bushii (Card. & Ther.) Card. & Ther.

The sandstone wall at Hidden Springs State Park (formerly Shelby County State Forest) created by the eroding action of Richland Creek harbored another community of bryophytes. The Musci found growing there were: Anomodon minor (Beauv.) Lindb., Tetraphis pellucida Hedw., Hygroamblystegium irriguum (Wils.) Leoske, Fissidens exiguus Sull., Brachythecium oxycladon (Brid.) J.&S., Anomodon attenuatus (Hedw.) Hueben, Eurhynchium serrulatum (Hedw.) Lindb., and Aulocomnium heterostichum (Hedw.) B.S.G. The hepatics found growing on the sandstone wall were: Conocephalum conicum (L.) Wiggers, Scapania nemorosa (L.) Dum., Reboulia hemisphaerica (L.) Raddi, and Phaeoceros laevis (L.) Posch. None of the above bryophytes mentioned, were found in any great frequency on the sandstone outcroppings.

Collections were made on rock outcroppings throughout the county. The rock inhabiting Musci were: Bryum argentum Hedw., Bryhnia graminicolor (Brid.) Grout, Weisia viridula Hedw., Hedwigia ciliata Hedw., Weisia microstoma (Hedw.) C. Muell., Leskea gracilescens Hedw., Grimmia apocarpa Hedw., and Dicranella varia (Hedw.) Schimp. Many of the rocks were in areas of direct sunlight. Grimmia apocarpa Hedw. and Dicranella varia (Hedw.) Schimp. seemed to occur mostly on unshaded rocks while other rupestral species favored more shaded rock outcrops.

Many bryophytes were found growing on the sides and ridges of ravines. These soil inhabiting bryophytes included: Polytrichum ohioense Ren. & Car., Ditrichum pallidum (Hedw.) Hampe, Atrichum angustatum (Brid.) B.S.G., Brachythecium salebrosum (W.&M.) B.S.G., Brachythecium oxycladon (Brid.) J.&S., Cirriphyllum boscii (Schwaegr.) Grout, Climacium americanum Brid.,

Campylium hispidulum (Brid.) Mitt., Bartramia pomiformis Hedw., Anomodon attenuatus (Hedw.) Hueben., Amblystegium varium (Hedw.) Lindb., Eurhynchium hians (Hedw.) J.&S., Entodon seductrix (Hedw.) C. Muell., Plagiothecium geophilum (Aust.) Grout, Mnium cuspidatum Hedw., Aulacomnium heterostichum (Hedw.) B.S.G., Atrichum undulatum Web. & Mohr., Rhodobryum roseum (B.S.G.) Limpr., Anomodon rostratus (Hedw.) Schimp., Thuidium delacatulum (Hedw.) Mitt., Thuidium recognitum (Hedw.) Lindb., Leucobryum glaucum (Hedw.) Schimp., Mnium affine Bland., Bryum pseudotriquetrum (Hedw.) Schwaegr., Dicranella heteromalla (Hedw.) Schimp., Entodon cladorrhizans (Hedw.) C. Muell., Dicranum scoparium Hedw., Leptodictyum riparium (Hedw.) Warnst., Physcomitrium turbinatum (Mx.) Brid., Plagiothecium deplanatum (Sull.) Grout, Amblystegium serpens (Hedw.) B.S.G., Plagiothecium mullerianum Schimp., Bryhnia graminicolor (Brid.) Grout, and Tortella humilis (Hedw.) Jennings. Of these bryophytes, the most common were: Atrichum angustatum (Brid.) B.S.G., Brachythecium salebrosum (W.&M.) B.S.G., Brachythecium oxycladon (Brid.) J.&S., Eurhynchium serrulatum (Hedw.) Lindb., Entodon seductrix (Hedw.) C. Muell., Mnium cuspidatum Hedw., and Anomodon rostratus (Hedw.) Schimp. Bryophytes rarely found on ravines in Shelby County were: Climacium americanum Brid., Campylium hispidulum (Brid.) Mitt., Plagiothecium geophilum (Aust.) Grout, Rhodobryum roseum (B.S.G.) Limpr., Dicranella heteromalla (Hedw.) Schimp., Entodon cladorrhizans (Hedw.) C. Muell., Physcomitrium turbinatum (Mx.) Brid., and Tortella humilis (Hedw.) Jennings. These were collected only once or twice during the two and a half years of collecting in Shelby County.

Several collections were made of corticolous bryophytes on the trunks, bases, and roots of trees. Most collections were from bark of

the white oak, Quercus alba L., and sugar maple, Acer saccharum Marsh. Among those collected were the following species: Leskea gracilescens Hedw. (trunk, chest high), Lophocolea heterophylla (Schrad.) Dum., Platygyrium repens (Brid.) B.S.G. (trunk, chest high), Entodon seductrix (Hedw.) C. Muell. (base of trees), Leucodon julaceus (Hedw.) Sull. (trunk, chest high), Leptodictyum riparium (Hedw.) Warnst. (base of trees), Mnium cuspidatum Hedw. (base and roots of tree), Brachythecium oxycladon (Brid.) J.&S. (base and roots of trees), Frullania eboracensis Gottsche (trunk, chest high - on Quercus sp.), Pylaisia selwynii Kindb. (trunk, chest high), Porella platyphylloidea (Schwin.) Lindb. (base of tree), Leptodictyum trichopodium (Schultz) Warnst. (base of trees and roots), Amblystegium serpens (Hedw.) B.S.G. (base of tree and roots), Eurhynchium hians (Hedw.) J.&S. (base of tree and roots), Thelia asprella Sull. (base of tree), Brachythecium salebrosum (W.&M.) B.S.G. (bases and roots of trees), Mnium stellare Hedw. (on base of tree), Orthotrichum pumilum Dicks (trunk, chest high), Orthotrichum pusillum Mitt. (trunk, chest high), Anomodon attenuatus (Hedw.) Hueben (base of tree), Frullania inflata Gottsche (trunk, chest high), Orthotrichum ohioense Sull. & Lesq. (trunk, chest high), Amblystegium varium (Hedw.) Kindb. (base of tree), Anomodon rostratus (Hedw.) Schimp. (base of tree), Mnium affine Bland.var. rugicum (Laur.) B.S.G. (base of tree), Anomodon minor (Beauv.) Kindb. (base of tree), Cephalozia media Kindb. (base of tree trunk), Leskea obscura Hedw. (trunk, chest high), Bazzania trilobata (L.) S.F. Gray (base of tree), and Bryhnia graminicolor (Brid.) Grout (base of tree). Most frequent among the corticolous species were: Leskea gracilescens Hedw., Platygyrium repens (Brid.) B.S.G., Anomodon attenuatus (Hedw.) Hueben, and Anomodon rostratus (Hedw.) Schimp. Infrequent collections from bark were: Leucodon

Julaceus (Hedw.) Sull., Frullania eboracensis Gottsche, Pylaisia selwynii Kindb., Thelia asprella Sull., Orthotrichum pusillum Mitt., Orthotrichum ohioense Sull. & Lesq., Cephalozia media Lindb., and Bazzania trilobata (L.) S.F. Gray.

Rotting log communities included: Eurhynchium serrulatum (Hedw.) Lindb., Leskea gracilescens Hedw., Platygyrium repens (Brid.) B.S.G., Leptodictyum riparium (Hedw.) Warnst., Entodon cladorrhizans (Hedw.) C. Muell., Plagiochila asplenioides (L.) Dum., Amblystegium serpens (Hedw.) B.S.G., Calypogia trichomanis (L.) Corda., Anomodon attenuatus (Hedw.) Hueben., Brachythecium salebrosum (W.&M.) B.S.G., Mnium affine Bland. var. rugicum (Laur.) B.S.G., Ulota crispa (Hedw.) Brid., Frullania asagrayana Mont., Leskea obscura Hedw. and Jamesoniella autumnalis (DeCand.) Steph., Eurhynchium serrulatum (Hedw.) Kindb., Platygyrium repens (Brid.) B.S.G., Leskea gracilescens Hedw., Brachythecium salebrosum (W.&M.) B.S.G., and Brachythecium oxycladon (Brid.) J.&S. were frequently collected. The infrequent species included: Ulota crispa (Hedw.) Brid. and Frullania asagrayana Mont.

Several collections were made in a variety of habitats: Amblystegium serpens (Hedw.) B.S.G. was collected on fence posts. Funaria hygrometrica Hedw. was collected on burned-over areas. Atrichum undulatum Web. & Mohr. was collected at the very edge of an oil road. Ditches, too, harbored such species as: Drepanocladus aduncus Hedw. var. kneiffii (B.S.G.) Warnst., Brachythecium campestre B.S.G., Entodon seductrix (Hedw.) C. Muell., Bryum argenteum Hedw., Bryum pseudotriquetrum (Hedw.) Schwaegr., Barbula unguiculata Hedw., Brachythecium oxycladon (Brid.) J.&S., Atrichum angustatum (Brid.) B.S.G., Mnium cuspidatum Hedw., Bryum cuspidatum (B.S.G.) Schimp., Bryum caespiticum Hedw., and Dicranella varia (Hedw.) Schimp.

In Shelby County, the most frequently collected pleurocarpous moss was Brachythecium salebrosum (W.&M.) B.S.G.; whereas, Atrichum angustatum (Brid.) B.S.G. outranked all other acrocarpous mosses in frequency. Lophocolea heterophylla (Schrad.) Dum. was the most frequently collected liverwort.

CONCLUSION AND SUMMARY

A review of the literature reveals that no studies have been made on the vegetation of Shelby County, Illinois. Of the ten county bryological studies and two state-wide bryological reports made in Illinois, none have made mention of the mosses and liverworts of Shelby County.

This research involves primarily a taxonomic survey of the bryophytes of Shelby County, Illinois. Eighty species of Musci were collected in Shelby County representing forty-nine genera. Sixteen species representing fourteen genera of Hepaticae were collected in various areas of Shelby County. Collections were made in various habitats: shaded and unshaded soils, ravine banks and ridges, rock outcroppings and sandstone banks, creek and river banks, tree bark and rotten logs. The collections were placed in standard bryological packets provided with standard data. The bryophytes were named and duplicates placed in the Ernest L. Stover Herbarium, Eastern Illinois University, Charleston, Illinois. Descriptions were prepared for each specimen. Permanent mounts were made of each species using Hoyer's mounting medium.

Of the ninety-six bryophytes collected, sixty-eight were frequently reported in previous Illinois publications. Seventeen species were rare, or considered to be rare. They were: Ephemerum serratum (Hedw.) Hampe, Cephalozia media Lindb., Orthotrichum pumilum Dicks, Brachythecium campestre B.S.G., Brotherella recurvans (Mx.) Fleisch., Bryum cuspidatum

(B.S.G.) Schimp., Fissidens bushii (Card. & Ther.) Card. & Ther., Mnium affine Bland. var. rugicum (Laur.) B.S.G., Mnium stellare Hedw., Orthotrichum ohioense Sull. & Lesq., Orthotrichum pusillum Mitt., Plagiothecium geophilum (Aust.) Grout., Plagiothecium mullerianum Schimp., Pohlia wahlenbergii (W.&M.) Andrews., Pylaisia selwynii Kindb., Ulotocrispa (Hedw.) Brid., Weisia microstoma (Hedw.) C. Muell. Seven species are new state records from Shelby County. These are: Fissidens bushii (Card. & Ther.) Card. & Ther., Pohlia wahlenbergii (Web. & Mohr.) Andrews, Ulotocrispa (Hedw.) Brid., Plagiothecium mullerianum Schimp., Pylaisia selwynii Kindb., Brachythecium campestre B.S.G., and Weisia microstoma (Hedw.) C. Muell.

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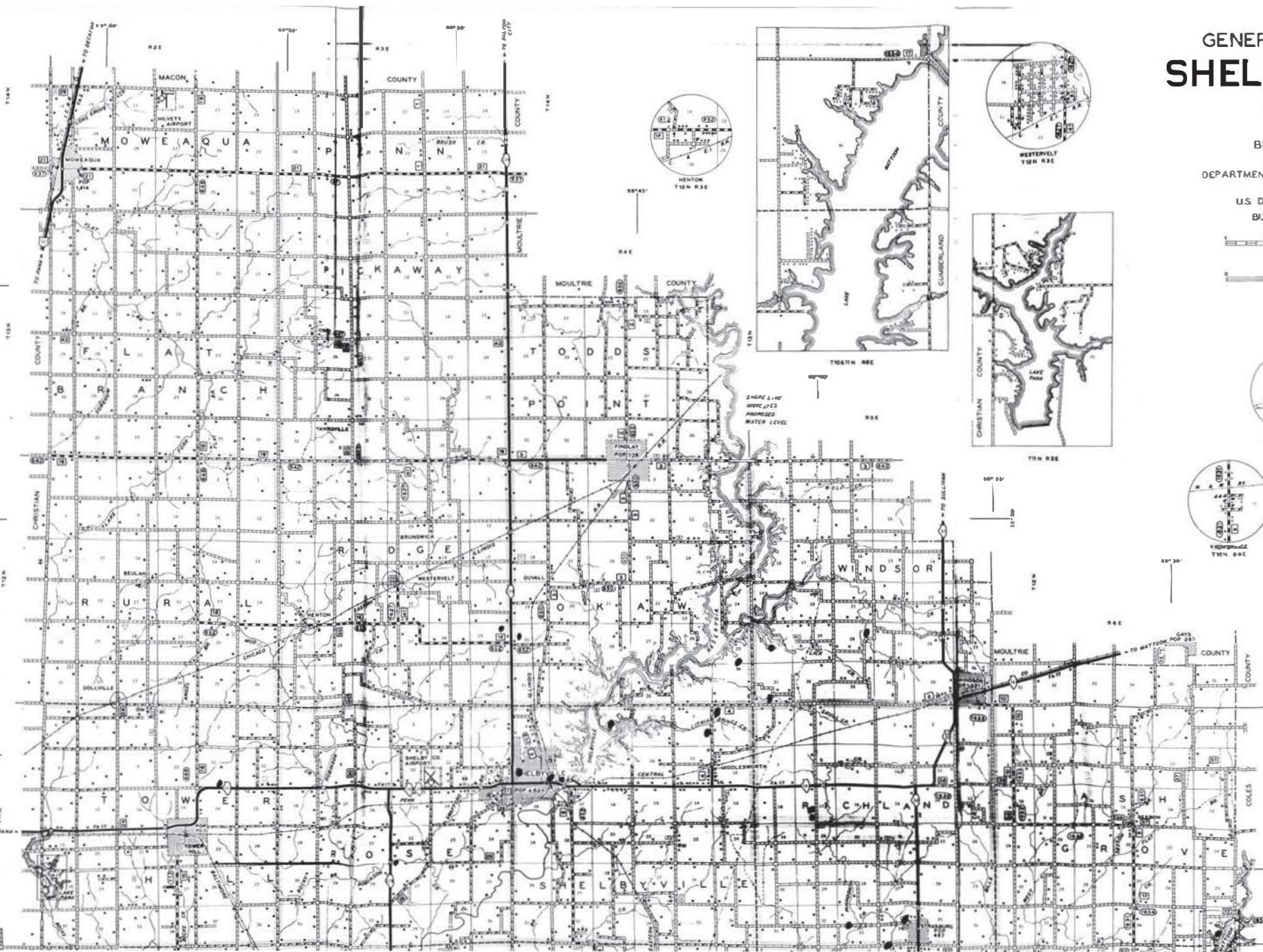
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